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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	1859.029USC4 (KRÜ0022-WO-US-T4)
First Named Inventor	Marc Krüger
Title	PORTION CAPSULE HAVING AN IDENTIFIER
Express Mail Label No.	via EFS at USPTO.GOV on June 12, 2019

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☐ **Fee Transmittal Form** (PTO/SB/17 or equivalent)
2. ☐ **Applicant asserts small entity status.** See 37 CFR 1.27
3. ☐ **Applicant certifies micro entity status.** See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
4. ☑ **Specification** [*Total Pages* 20] Both the claims and abstract must start on a new page. *(See MPEP § 608.01(a) for information on the preferred arrangement)*
5. ☑ **Drawing(s)** (35 U.S.C. 113) [*Total Sheets* 12]
6. **Inventor's Oath or Declaration** [*Total Pages* 1] *(including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e))*
   a. ☐ Newly executed (original or copy)
   b. ☑ A copy from a prior application (37 CFR 1.63(d))
7. ☑ **Application Data Sheet** ** See note below.* See 37 CFR 1.76 (PTO/AIA/14 or equivalent)
8. **CD-ROM or CD-R** in duplicate, large table, or Computer Program (*Appendix*)
   ☐ Landscape Table on CD
9. **Nucleotide and/or Amino Acid Sequence Submission** (*if applicable, items a. – c. are required*)
   a. ☐ Computer Readable Form (CRF)
   b. ☐ Specification Sequence Listing on:
      i. ☐ CD-ROM or CD-R (2 copies); or
      ii. ☐ Paper
   c. ☐ Statements verifying identity of above copies

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ACCOMPANYING APPLICATION PAPERS

10. ☐ **Assignment Papers** (cover sheet & document(s))
    Name of Assignee _____
11. ☐ **37 CFR 3.73(c) Statement** (*when there is an assignee*) ☑ **Power of Attorney**
12. ☐ **English Translation Document** (*if applicable*)
13. ☑ **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    ☐ Copies of citations attached
14. ☐ **Preliminary Amendment**
15. ☐ **Return Receipt Postcard** (*MPEP § 503*) (*Should be specifically itemized*)
16. ☐ **Certified Copy of Priority Document(s)** (*if foreign priority is claimed*)
17. ☐ **Nonpublication Request** Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
18. ☑ **Other:** USPTO is hereby authorized to charge any additional fees required under 37 C.F.R. Sec. 1.16; 1.17 and 1.21 to Deposit Acct. No. 50-1097

Note*: (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must be included in an Application Data Sheet (ADS).
(2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS

☑ The address associated with Customer Number: 25215 **OR** ☐ Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email	

Signature	/Paul J. Palinski/	Date	June 12, 2019
Name (Print/Type)	Paul J. Palinski	Registration No. (Attorney/Agent)	71080

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	PORTION CAPSULE HAVING AN IDENTIFIER
First Named Inventor/Applicant Name:	Marc Krüger
Filer:	Paul J. Palinski/BECKY BALLARD
Attorney Docket Number:	1859.029USC4

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	300	300
UTILITY SEARCH FEE	1111	1	660	660
UTILITY EXAMINATION FEE	1311	1	760	760
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1720**

Electronic Acknowledgement Receipt

EFS ID:	36274854
Application Number:	16438818
International Application Number:	
Confirmation Number:	8813
Title of Invention:	PORTION CAPSULE HAVING AN IDENTIFIER
First Named Inventor/Applicant Name:	Marc Krüger
Customer Number:	25215
Filer:	Paul J. Palinski/BECKY BALLARD
Filer Authorized By:	Paul J. Palinski
Attorney Docket Number:	1859.029USC4
Receipt Date:	12-JUN-2019
Filing Date:	
Time Stamp:	13:27:36
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1720
RAM confirmation Number	061219INTEFSW00011220501097
Deposit Account	501097
Authorized User	BECKY BALLARD

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		ParentApplication.pdf	1590115 2a263a4fcba7b898e9ea62b688ad95c3d6a8f520	yes	32
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Specification		1	18	
	Claims		19	19	
	Abstract		20	20	
	Drawings-only black and white line drawings		21	32	
Warnings:					
Information:					
2	Application Data Sheet	ADS_1859_029USC4_KRU0022_WO_US_T4.pdf	1256360 c0c44e0326ec5ed27bf42ff4c7d5c1471b1ba3d8	no	9
Warnings:					
Information:					
3	Power of Attorney	PowerOfAttorney_1859_029USC4_KRU0022_WO_US_T4.pdf	636907 6e839bba6d242f8929e64ac938d4a3467d733779	no	1
Warnings:					
Information:					
4	Oath or Declaration filed	Oath_Dec_1859_029USC4_KRU0022_WO_US_T4.pdf	117431 8e00a14af23d177db6fe9200e0a1232ab187161c	no	1
Warnings:					
Information:					

5	Information Disclosure Statement (IDS) Form (SB08)	IDS_1859_029USC4_KRU0022_WO_US_T4.pdf	757068 8a496c871e958ea70821180b764eed5cfaaff328	no	29
Warnings:					
Information:					
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6	Transmittal of New Application	Transmittal_1859_029USC4_KRU0022_WO_US_T4.pdf	310834 c1e1d19700058bbf94c92d24d70c8c636501d46a	no	2
Warnings:					
Information:					
7	Fee Worksheet (SB06)	fee-info.pdf	35132 255b9a39a9295d164b897f7a65436b4e2a0066d0	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	4703847	

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PORTION CAPSULE HAVING AN IDENTIFIER

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims benefit from and is a divisional of U.S. Application No. 15/211,823 filled July 15, 2016 entitled PORTION CAPSULE HAVING AN IDENTIFIER, which claims benefit from and is a continuation of U.S. Application No. 13/744,623, filed January 18, 2013, entitled PORTION CAPSULE HAVING AN IDENTIFIER, which claims benefit from International Application No. PCT/EP2011/003677, filed on July 22, 2011, entitled PORTION CAPSULE HAVING AN IDENTIFIER, which applications are hereby incorporated by reference in their entirety.

BACKGROUND

[0002] The present invention relates to a portion capsule for producing a beverage, comprising a base element having a cavity in which a beverage raw material is provided and which is closed by a membrane fastened to the base element.

[0003] Such capsules are well known and are being launched onto the market in abundant variety. Since these capsules are often quite similar, it is possible that the manufacturer's capsules are used in a coffee machine designed by another manufacturer, although they are not suited for it. This may result in significant security issues and/or the coffee machine may be damaged.

[0004] The object of the present invention is therefore to provide a portion capsule which only is suitable for a specific coffee machine.

SUMMARY

[0005] The object is accomplished according to the present invention by a portion capsule for producing a beverage, comprising a base element having a cavity in which a beverage raw material is provided and which is closed by a membrane fastened to the base element, wherein it has an identifier, which allows to individualize the respective portion capsule.

[0006] The present invention relates to a capsule for producing a beverage or foodstuff, comprising a base element having a cavity in which a beverage raw material is provided. Such capsules are, for example made of plastic, natural materials and/or biodegradable materials

and substantially have a base element, in particular a deep-drown base element, i.e. it is substantially designed frustoconically or cylindrically. The beverage raw material is arranged within the portion capsule's cavity and is extracted and/or dissolved in a liquid, in particular water. After the beverage raw material has been filled into the cavity the base element is usually sealed by a membrane. In particular the membrane is localized on the opposite side of the base element's bottom. The membrane can be made of the same or different material as the base element and is substantially attached to the base element using a sealing and/or an adhesive bonding. Additionally the cavity could contain one or several built-in elements, such as, for example a filter, a non-woven, a felt, a shut-off device and/or something similar to those. For the case that a non-woven and a felt are arranged within the cavity, they are interconnected preferably. The non-woven and/or the felt can be made of several layers in such a way that the layers may differ in the kind of its starting material and/or its preparation. Moreover the membrane and/or the bottom can be provided with a plurality of recesses (holes).

[0007] According to the present invention, it is provided that the portion capsule has an identifier that allows to individualize the respective portion capsule. In the context of this invention individualizing means that the respective portion capsule can be assigned to a group of capsules that are suitable for the coffee machine preferably. It is not necessary that the coffee machine is able to specify and/or identify the portion capsule. In fact it is much more important that the coffee machine associates the portion capsule with a group of portion capsules, which is suitable for the coffee machine. In particular, individualizing means that those portion capsules that are not appropriate for the coffee machine cannot be inserted into and/or directly fall through the holder, which is designed for the portion capsules in the coffee machine, and/or the coffee machine operates only with the corresponding portion capsules. Preferably a sensor/detection system handles the identifier and compares it with a stored reference substantially. Preferably, the coffee machine, in particular the water-providing-pressure pump, will be activated if the detected identifier matches with the reference. Otherwise the coffee machine will not start operating. Preferably the detection system is placed in the region of the coffee machine's media chute designed for the portion capsules. According to another preferred embodiment of the invention, the detection system may be placed in the region of the brewing chamber. Another possible embodiment of the invention provides that the identifier prevents portion capsules from inserting into the coffee machine. Alternatively or additionally, means, in particular mechanical means, more preferably, one or

more gearwheels, may be added to the media chute in order to guarantee that incorrect portion capsule cannot be inserted into the coffee machines by passing the media chute.

[0008] Preferably the identifier is composed of surface areas having different optical properties, for example reflection. These surfaces may be localized on the membrane, the side wall and/or the bottom of the portion capsules. Preferably, the portion capsule has at least two areas which differ in their optical properties, for example the reflection characteristics.

[0009] The detection of a recess and/or a bulge is also preferred. Preferably, recess and bulges alternate and/or at least two recesses or bulges are separately placed from each other. Especially it is possible that the recess and/or the bulge form a gearwheel that is attached to the outer border and/or at least partially extends to the wall region of the portion capsule. The recess and/or bulge may be produced by any shaping method, for example by deep drawing, preferably.

[00010] Furthermore, the recess may be realized by removing material. In particular the material's remove can be accomplished by punching or using a laser on condition that this processing does not damage a barrier layer placed in the portion capsule's material, which prevents moisture or aroma from escaping out of the portion capsule and/or water vapor or oxygen enters the capsule. The reading of the identifier, which is encoded in the recess and/or bulge, may be a result from a mechanical and/or optical method, for example. Alternatively or additionally, the identifier can be used to avoid that the portion capsule is inserted into the coffee machine. This applies in particular to the media chute. For example it is possible to design a portion capsule comprising a ring gear that is placed on its circumference and is compatible with another ring gear, which is placed in the media chute. If the media chute's ring gear only revolves for a corresponding ring gear of the portion capsule and its revolving allows the portion capsule to pass, only portion capsules equipped with the proper ring gear will pass the insertion lock.

[00011] According to a further subject matter of a preferred development of the present invention, the identifier may be included in the membrane. Preferably, the identifier is a layer or partial layer of the membrane. Such identifiers may be an optically detectable material, for example a fluorescent material. Furthermore, the identifier may be designed with layers made

of metal or ferrous metal or stripes made of metal or ferrous metal in or on the membrane, respectively.

[00012] Preferably the identifier is a machine-readable imprint. This is realized with a print in food approved color, preferably. Fluorescent materials like paper or print materials, whose optical properties change under the influence of temperature, are favored also. Preferably the print is a barcode, a logo or a rapport.

[00013] According to a further subject matter of a preferred development of the present invention, the identifier is an electrically conductive section, which can be placed all over the portion capsule, but is localized on the side wall, the edge and / or the floor preferably. The electrically conductive section, which is inserted into the coffee machine, can become part of an electric circuit and causes therefore a measurable change, which leads to the identification of the respective portion capsule. In a further preferred embodiment, the identifier is a section made of a ferromagnetic material.

[00014] Another construction version favors a RFID chip being the identifier.

[00015] If the portion capsule is customized according to the invention, portion capsules that are not in line with the coffee machine will be prevented from inserting into the coffee machine. Furthermore it is possible that the identifier allows to identify the portion capsule located in the brewing chamber in such a way that the production process of beverage or food may be controlled, for example by adjusting the temperature, the pressure and/or the amount of water.

[00016] According to a further subject matter of a preferred development of the present invention, the portion capsule's material is weakened in the bottom area caused by a selective material removal, for example by using a laser. The weakening is provided for piercing the portion capsules using a mandrel. This procedure is needed for the beverage's preparation. Since the material is weakened in the section, which is treated with a laser and is supposed to be pierced using the mandrel, the degree of necessary force for piercing the portion capsule is reduced. The mandrel of such coffee machines is usually equipped with a force limitation that limits the force, which is dedicated for pressing the mandrel against the portion capsule's bottom. This preparation avoids that portion capsules having no appropriate weakening can be

used in such a coffee machine. Consequently the weakening represents another kind of identifier.

[00017] According to a further subject matter of a preferred development of the present invention, the portion capsule has an edge region, which is preferably attached to the base element. Preferably, the edge is located opposite of the base element's bottom area. After the raw material has been filled in the portion capsule, a membrane can be attached to this edge region, for instance. Moreover the edge can also designed for guiding the portion capsule into the chute in order to position the portion capsule in the brewing chamber properly. Simultaneously it is possible to use the surface of the edge for stopping and/or sealing.

[00018] Preferably provision is made for the portion capsule to have means for fit locking, friction locking and/or detection in the edge region. The means for fit locking and/or friction locking may be used to activate a complementary mechanism, which is located in the coffee machine, in order to allow inserting the portion capsule into the coffee machine and/or starting a sensor, like a gearwheel, that transmits a signal to a control unit depending on whether the portion capsule corresponds to the coffee machine or not. Alternatively or additionally, a detector may identify the mean for fit locking, friction locking and/or detection in order to check that the portion capsule is suitable to the respective coffee machine.

[00019] Preferably the means for fit locking, friction locking and/or detection is a gearwheel or a gearwheel' segment, which are located, in particular, in the outer area of the edge region. The teeth of the gearwheel or the gearwheel' segment may be shaped in any commonly used form, which is known, for example, by an expert from gear manufacturing. Preferably it is provided that these teeth are triangular, rectangular, square or wavy.

[00020] Preferably there is a sealing surface, that is arranged on the interior side relative to the gearwheel or the gearwheel' segment.

[00021] Another and preferred state-of-the-art technology is a portion capsule for producing a beverage, comprising a base element substantially designed frustoconically or cylindrically, having a cavity in which a beverage raw material is provided and which is closed by a membrane fastened to the base element with the base element having a wall region and the base element having a bottom area, which is preferably located opposite to the

membrane, with the wall region having several grooves and the grooves which are located between membrane and bottom area covering the wall region along its height at least partially. The grooves may be also located in the edge region, in particular on the outer area of the edge region.

[00022] This portion capsule has the advantage over the portion capsule according to the state-of-the-art technology that, for instance, the grooves reinforce the base element's wall region. On the one side these grooves make the portion capsule more stable towards mechanical forces and prevent the portion capsule from deformation and buckling, in particular. The arrangement of the grooves, which are located at the wall region, additionally improves the performance of the portion capsule while the extraction liquid flows through it in the brewing chamber, since the arrangement of the grooves, in particular those partially expending over the wall region between membrane and bottom area, increase quality and reliability of the extraction process significantly. According to the invention another advantage is that the base element's thickness can be reduced, because the use of grooves improves the physical stability. The production of the portion capsule is therefore much less expensive and more environmentally friendly. On the other side the grooves reduce or avoid the contact between the portion capsule's wall region and the wall of the brewing chamber. As a result ejecting or removing the portion capsule from the brewing chamber is made easier. Another advantage of using a plurality of grooves is that the stream of the extraction liquid, which flows along the base element in the cavity, can be optimized by choosing a grooves' structure that is able, for example, to generate on the one hand a better or stronger turbulence in the extraction liquid or on the other hand a more uniform (laminar) flow of the extraction liquid, in the wall region. The control of the liquid may be obtained by the structure of the grooves itself or by using simple means additionally. A stronger turbulence compared to the one known in the state-of-the-art has the advantage that no unintended and casual main streams are formed in the raw materials. Instead the extraction liquid equally flows through the raw material in all of the volume. Thus the extraction process is much more efficient and can be controlled more precisely and reproducibly.

[00023] In particular the raw material may be coffee powder (especially ground roasted coffee), chocolate powder, milk powder, tea or the like. Alternatively, it is conceivable that the raw material is a beverage's extract, such as instant coffee for example.

[00024] In particular, the grooves are recesses and bulges, which are preferably directed along a main extension and are preferably extended along the wall portion or the periphery of the edge region. More preferably, the grooves are formed as webs and/or notches. A gearwheel, for instance, may be obtained by the grooves. Therefore the grooves are part of the base elements' wall, optionally located on the inner side facing to the cavity and/or on the outside facing away from the cavity.

[00025] According to a preferred embodiment of the present invention, it is provided that the grooves form an identifier that allows individualizing the portion capsule. In the context of this invention individualizing preferably means that the respective portion capsule can be assigned to a group of capsules that are suitable for the respective coffee machine or the machine producing a beverage. It is not necessary that the coffee machine or the device for producing a beverage is able to specify and/or identify the portion capsule. It is more important that the device for producing a beverage, in particular a coffee machine, associates the portion capsule with a group of portion capsules, which is appropriate for the respective device for producing a beverage, in particular a coffee machine. In particular, individualizing means that those portion capsules that are not appropriate for the coffee machine (or the device producing the beverage) cannot be inserted into and/or directly fall through the holder, which is designed for the portion capsules in the coffee machine (or the device producing the beverage), and/or the coffee machine (or the device producing the beverage) operates only with corresponding portion capsules ("proper portion capsule"). In particular, individualizing means that the coffee machine or the device producing the beverage will not operate properly in the intended use, if the used portion capsule is not customized according to the invention. Preferably a sensor/detection system, attached to the coffee machine or the device producing the beverage, records the identifier and substantially compares it with a stored reference. In particular, it is possible that such an identification process is based on a mechanical fitting, especially a fitting of a gearwheel or of a contour comparable with a gearwheel, which is attached to the device producing the beverage or the coffee machine and interacts with the portion capsule. It is preferred that the device for producing the beverage or the coffee machine only will operate, if the identifier matches to the reference or the mechanical fittings match with each other. In this case the device for producing the beverage particularly starts to operate, especially activates a pressure or water pump. The mean for detection or mechanical fitting is preferably located in the region of the media chute or in the region of the device for producing the beverage. Alternatively the identifier or the mechanical fitting may avoid that

an unsuitable portion capsule is inserted into the device for producing the beverage. A portion capsule, which is designed in accordance with the invention, makes it possible that a portion capsule that is not designed for the device for producing a beverage cannot be inserted into it. Additionally the identifier allows that the device for producing the beverage, especially the coffee machine, may specify the sort of the portion capsule and thereby control the production process of beverage and food by adapting, for example, the pressure, the temperature and/or the amount of water.

[00026] According to a further preferred embodiment of the present invention, it is provided that at least a part of the grooves and at least in a subarea parallel to the main plane of the membrane is gearwheel shaped.

[00027] According to the present invention it is an advantage that it is possible to increase the stability of the portion capsule's wall region, to realize improved turbulences of the extraction liquid and thereby to improve the extraction's process under the same conditions, for example, such as material thickness and the like. Another advantage is that it is easy to generate a mechanical identifier or a mechanical fitting that matches with a fitting tool that belongs to the device for producing a beverage. According to the invention it is an further advantage that, for example, a gearwheel, which is attached to the device for producing a beverage and is, for example, located in the region of the media chute or similar, can possibly interacts with the gearwheel's contour of the portion capsule. In this way it is possible to generate a mechanical fitting that allow to individualize the portion capsule as a proper one and/or to specify the sort of portion capsule and/or to rotate the portion capsule about an axis of rotation, that is perpendicular to the membrane's main plane, by using the gearwheel's arrangement. Such an embodiment of the invention makes it possible that the portion capsule is always opened with the device for producing a beverage on the same spot (with respect to its angular position) and therefore the raw material is extracted on the same manner. Moreover the grooves prevent the portion capsule from being inserted into the coffee machine.

[00028] In a preferred version of the invention, it is provided that there is a flange/edge region being averted from the bottom region, for fixing the membrane to the base element, where in the wall region between flange/edge region and bottom region preferably has a border and the grooves are being preferably extended to this border.

[00029] Because of this it is another advantage according to the invention that on the one hand the wall region can be constructed in a stable and reinforced manner and on the other hand the gearwheel shaped contour of the grooves, located at the wall region, is able to absorb a relative high load. With that it is possible that the portion capsule can be rotated easily and without any damaging of the portion capsule within the device for producing a beverage.

[00030] Preferably the base element's diameter is enlarged in the border's region compared to the wall region, which range from the border to the bottom region.

[00031] This gives rise to the advantageous possibility to stack portion capsule or portion capsules' base elements easily and robustly.

[00032] Moreover it is preferred that at least a part of the grooves are gearwheel shaped and at least a plane, which is at least partially gearwheel shaped, is parallel to the membrane in such a way that the gearwheel shaped contour expands over the borders or the flange/edge region.

[00033] Further preferred versions of the present invention relate to portion capsules that implement one or more of the following characteristics:

- the base element tapers in the direction of the flange in the border's region,
- the grooves directed toward the bottom region expand over the border's region,
- the grooves approximately cover 20% -80%, preferably 40% - 60% of the wall region, which is placed between the border and the bottom region,
- the grooves are constructed in such a way that the wall region is reinforced and/or the grooves causes an extraction liquid's turbulence in the cavity.

[00034] Other preferred versions of the present invention relate to portion capsules that are manufactured in such a way that the ratio of the diameter of that wall region of the base element which adjoins the flange to the diameter of the flange is between 0.85 and 0.89, and in particular substantially 0.87.

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[00035] In a preferred version the wall region's diameter, which is adjacent to the flange, is 39 millimeter and the flange's diameter is 45 millimeter. Another advantageous version of the invention prefers a base element having a thicker wall region in the border's region compared to the wall region between bottom region and flange. Since the portion capsule's design, which contains grooves in the wall region, improve its stability, it is possible to save material by manufacturing the portion capsule and therefore to reduce cost and energy required for manufacturing the portion capsules.

[00036] According to the invention it is further provided that a filter element is arranged into the cavity. Such a filter element divides the cavity into a first region for accommodating the beverage raw material and into a second region for accommodating a beverage extract. In particular, it is provided that the filter element is made of a non-woven material.

[00037] According to a further subject matter or a preferred development of the present invention the portion capsule according to the invention is intended for the preparation of a hot beverage. In the following the invention is explained based on the Figures 1 – 22. These explanations do not restrict the general idea of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[00038] **Figure 1** shows a portion capsule containing sections that differs optically.

[00039] **Figure 2** shows a portion capsule containing a barcode.

[00040] **Figure 3** shows a portion capsule with recesses and bulges.

[00041] **Figure 4** shows a portion capsule containing sections that differs optically.

[00042] **Figure 5** shows a portion capsule with a key function.

[00043] **Figure 6** shows a portion capsule's wall that is electrically conductive.

[00044] **Figure 7** shows a portion capsule's wall containing sections that differs optically.

[00045] **Figure 8** shows an enlarged pot construction of the portion capsule's wall.

[00046] **Figure 9** shows an edge region that is electrically conductive.

[00047] **Figure 10** shows a portion capsule containing a bottom that is electrically conductive.

[00048] **Figure 11** shows an embodiment containing a layer that can be detected by a metal detector.

[00049] **Figure 12** shows a metallic strainer.

[00050] **Figure 13** shows a portion capsule containing a ferromagnetic section.

[00051] **Figure 14** shows a portion capsule containing a barcode.

[00052] **Figure 15** shows a portion capsule containing a section, which is electrically conductive, in the wall.

[00053] **Figure 16** shows a portion capsule with a gearwheel placed in the brewing chamber.

[00054] **Figures 17 a-c** show different embodiments of the portion capsule according to Figure 16.

[00055] **Figure 18** shows the portion capsule according to the Figures 16 and 17, when the portion capsule is fit locking with a gearwheel.

[00056] **Figures 19 and 20** show a schematic view of a portion capsule according to an embodiment of the presented invention.

[00057] **Figures 21 and 22** show two sectional views of the portion capsule according to an embodiment of the presented invention.

DETAILED DESCRIPTION

[00058] The view illustrated on the right side of **Figure 1** shows a portion capsule 1 comprising a base element 2 that has a wall region 2.1 and a bottom area 2.2. The wall region 2.1 and the bottom area 2.2 define a cavity, which may include the raw material and perhaps a built-in element. After filling the cavity is sealed by a membrane, which is preferably attached to the edge region 2.4 of the base element using seal or glue. This portion capsule can be inserted into a brewing chamber shown in Figure 12, with a liquid, in particular water, flowing through it. During this process the raw material is extracted or dissolved and therefore the beverage is produced. According to the invention the portion capsule has only one identifier that allows to determinate whether the respective portion capsule goes with the coffee machine's brewing chamber and the parameters for processing are chosen properly. If it is not the case, significant security issues arise. Inserting the wrong portion capsule, for example, endanger the brewing chamber's tightness. In this case hot water can be discharged under high pressure and therefore compromise the user's safety. Otherwise it is also possible that inserting the wrong portion capsule damages the coffee machine. In this example the identifier is represented by several raised areas 8, which differ in reflection properties from the sections between the raised areas. As shown by the arrows the bulges are passed by a mean for detection (here: an optical detector) that is able to differentiate between the unequal sections 5, 6 having different optical properties such as, for example, reflection. Switching between the different sections or the number of bulges represents the identifier. After the identifier has been read out the identifier is compared to a stored reference. If the identifier agrees with the reference, the coffee machine will start operating. Particularly the pump, which is for example responsible for pushing hot water through the brewing chamber, will not start operating, if the identifier does not agree with the reference.

[00059] All the remarks concerning the identifier apply to all the examples.

[00060] **Figure 2** shows another embodiment of the portion capsule according to the invention. Here the portion capsule has a barcode placed in the area of the membrane's top surface. This bar-code may be printed by material removal or may be generated by a medium that is integrated in the foil and can be detected optically such as a fluorescence agent.

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Alternatively metal rings may be part of the foil or attached to the foil. The bar-code's section may be made of a ferromagnetic material. As shown by the arrow 15 the bar-code alternatively can be attached to the base element's edge region being averted from the membrane. Such a bar-code is read out by a detector 13 placed, for example, in the media chute. The bar-code represents the identifier according to invention.

[00061] **Figure 3** shows another embodiment of the portion capsule according to the invention. In the present case the identifier comprises recesses and bulges, which result from material removal or reshaping the portion capsule as shown here by the example of the portion capsule's wall 2.1. In the present case recesses and bulges interact with a mean for detection 13, which operates like a key, wherein the coffee machine only start operating, when all elements 13 are placed in the respective recess. Therefore an electric circuit may be changed or especially closed.

[00062] **Figure 4** shows an embodiment of the portion capsule being substantially identical to the embodiment illustrated in Figure 1. As an alternative version of the invention the figure additionally shows that the sections differing in terms of optical properties can be attached to the cover foil, for example in the form of a bar-code.

[00063] **Figure 5** shows an embodiment of the portion capsule being substantially identical to the embodiment illustrated in Figure 3. Again the recesses represent the key bit. The coffee machine only will start operating, if the recesses interact with the corresponding bulges and therefore an electric circuit is changed respectively. The placement of such a system is not restricted to the brewing chamber. For instance the system may be placed in the portion capsule's media chute.

[00064] **Figure 6** shows a version of the invention that includes an electric material forming a surrounding ring, which preferably has a raised form. The electrically conductive material is scanned by electric sliding contacts, which are placed in the media chute and form electric contacts of an electric circuit, while the portion capsule is inserted.

[00065] **Figure 7** an embodiment of the portion capsule being substantially identical to the embodiment illustrated in Figure 6, in which it is provided that the ring area has reflective or mat sections, for example in form of a covering, and allows a read-out by means for optical

detection, which are placed in the media chute and are part of a control current, while the portion capsule is inserted.

[00066] **Figure 8** shows a relative broad and raised ring which represents the identifier. The media chute is equipped with a corresponding vacancy that tests whether the portion capsule has the proper identifier. The broad ring is scanned, for example, by mechanical sensors, which are placed in the media chute and close the contacts of an electric circuit, while the portions capsule is inserted.

[00067] **Figure 9** shows another embodiment of the portion capsule according to the invention. In the present case an electrically conductive coat is integrated in the edge region's back and is scanned by electric sliding contacts, which are placed in the media chute and form electric contacts of an electric circuit, while the portion capsule is inserted.

[00068] **Figure 10** shows another embodiment of the portion capsule according to the invention. In the present case the portion capsule has an electrically conductive coat such as a conductive varnish layer or an aluminum foil. The coat is scanned by electric sliding contacts, which form electric contacts of an electric circuit, while the portion capsule is inserted.

[00069] **Figure 11** illustrates a version of the portion capsule having also an electrically conductive coat that is placed on its bottom and is identified by a metal sensor, which is placed in the chute and, for example, detects inductively, while the portion capsule is inserted.

[00070] The embodiment of the invention shown in **Figure 12** has a build-in element made of metal (here a strainer 19) that is recognized as identifier by a metal detector.

[00071] The version of the invention shown in **Figure 13** includes a ferromagnetic material placed at the portion capsule' bottom. The identifier is scanned, for example, by a magnet, which is placed in the chute, while the portion capsule is inserted. The ferromagnetic material acts as identifier.

[00072] **Figure 10** shows another embodiment which includes a bar-code placed in the region of the cover foil.

[00073] According to the embodiment shown in **Figure 15** a metallic ring is integrated in the wall and closes an electric circuit placed in region of the brewing chamber.

[00074] **Figure 16** shows another embodiment of the portion capsule 1 according to the invention. The illustrated portion capsule features a base element that is basically conical-shaped in the present case and has a bottom region 2.2 and a wall region 2.1. It is provided that the base element contains the raw material and, if necessary, build-in elements like a filter as illustrated here. The expert knows that the build-in element may also include other build-in elements. A flange/edge region 2.4, which is preferably circular and, for example, may be used for sealing a cover foil to it, is attached to the end of the base element, which is placed opposite to the bottom. The flange/edge region has means for fit locking, friction locking and/or detection 2.4.2 in the outer area (outer circumference). As especially shown in the Figures 17a – 17c the mean 2.4.2 is, in the present case, a gearwheel that is formed by several recesses/bulges evenly arranged in the edge region. Preferably, it is provided that the edge region has a sealing surface, which sealingly interacts with the sealing 21 attached to the brewing chamber 27, on the interior side of the gearwheel. The sealing 21 makes sure that the water coming from a water inlet 28 flows rather through the portion capsule by passing a opening, which has been made by a mandrel 29, than around it.

[00075] **Figures 17a – 17c** show different embodiments of the mean 2.4.2.. According to the version shown in Figure 17a the gearwheel has forty-five teeth. According to the version shown in Figure 17b or 17c the gearwheel has twenty-two or twenty-nine teeth, respectively. The expert knows that the manufactured teeth can be shaped arbitrarily. All Figures 17a – 17c demonstrate how the portion capsule 1 can be hold by a part of the brewing chamber 27 using two holding arms 30. The holding arms interacts with the mean 2.4.2. If they are not available, the holding arms will not hold the portion capsule and the portion capsule will not be inserted into the brewing chamber and will fall through it into a dropping box instead.

[00076] **Figure 18** shows the mean 2.4.2. along with an mean for fit locking 24, which is attached to the coffee machine and is represented by a pinion here. It is provided that the mean for fit locking 24 is placed in the media chute having a port for inserting the portion capsule in the coffee machine. The distance between the inner wall of the portion capsule 25 and the pinion 27 are designed in such a way that the portion capsule only will pass the port,

if the mean for fit locking is formed complementary to the teeth of the pinion 27. Only in this case the portion capsule rotates the pinion 24 while it falls. Both rotating and falling are represented by arrows in the figure. The portion capsule needs the rotation for passing the media chute's port and falling in the intended position afterwards. If the portion capsule has no or wrong mean of fit locking, it will be impossible to place the portion capsule by passing the media chute in the intended position. Additionally or alternatively it is provided that the pinion 24 has a pick-up that detects the rotary movement and transmits it to a control unit. If the rotation at least correspond a defined rotating element, the control unit will activate, for example, the brewing unit. The expert knows that the portion capsule's border may include means for friction locking that interacts with a mean, for example an edge, and shift it in such a way that the shift is detected and therefore the brewing chamber is activated.

[00077] The expert moreover knows that a sensor, being for example a camera, which detects the form of the mean 2.4.2., may be installed in the media chute. In the present case the form and/or the distance between the teeth may be detected. If the proper portion capsule was inserted, a resulting signal could be transmitted to a control unit, which activates the brewing chamber.

[00078] **Figure 19** schematically shows a view of another portion capsule's version according to an embodiment of the present invention. **Figure 20** illustrates the same portion capsule from a different point of view schematically. Figure 19 shows the front view of the portion capsule. Figure 20 shows the portion capsule viewed from an angle below. In all figures the portion capsule is labeled with the reference sign 1. The portion capsule substantially has a frustoconically shaped base element 2, which is formed similar to a pot and encloses a cavity 3. The cavity 3 is sealed by a membrane 4. Since the viewing direction of Figure 1 is essentially parallel to the plane, in which the membrane is located, the figure just adumbrate the membrane at the upper edge of the portion capsule. In particular the base element 2 comprises a soft, semi-rigid or rigid plastic material which is deep-drown, preferably. The membrane comprises a foil made of plastic material or aluminum. Preferably the base element has a circumferential mounting flange 17 in the region of the membrane, with the membrane and the mounting flange 17 being firmly bonded, in particular by welding or gluing. Preferably a filter element, which is not specifically depicted in the figures, is placed within the base element 2. For instance, the filter element is made of thermoplastic resin such as, for example, polypropylene. The filter element could also be made of a non-

woven material such as, for example, thermoplastic resin. Preferably the filter element divides the cavity 3 in two sections. It is provided that the first section can be filled with a raw material and the second section can be filled with and particularly collect a beverage's extract, which is not shown, during the extractions process. Both sections are not illustrated individually.

[00079] The portion capsule is intended for inserting into a brewing chamber or a device for producing a beverage, which is not shown here. In particular such a device for producing a beverage is a coffee machine. The device for producing a beverage could be also a machine that produces a tea drink, a chocolate drink or any other beverage. Preferably an extraction liquid, which is particularly water or hot water, is brought under high pressure into the brewing chamber of the device for producing a beverage. The extraction liquid interacts with the raw material of the beverage in such a way that an extract of a beverage or a beverage is generated. In particular the filter element is utilized as a strainer for the extract of a beverage.

[00080] According to the invention the base element 2 has a wall region 12 and a bottom area 11. The wall region 12 basically ranges from the flange 17 to the bottom region 11. Several grooves 15 are placed in the wall region. In particular these grooves are keyways that are integrated in the wall region 12 and are facing the cavity 3 and range from the flange 17 to the bottom region 11 (i.e. they run perpendicular according to Figure 19). According to the invention provision is made for the grooves 15 to be extended vertically across the wall region, i.e. they run straight from the flange 17 to the bottom region 11, in which it is not necessary that they are extended over the whole length. The grooves are formed according to the invention in such a way that the wall region is reinforced or stiffened due to the grooves 15. Moreover the plurality of the grooves 15, which are distributed over the wall region 12, realize an adhesion between wall region 12 and the brewing chamber's wall of the device for producing a beverage after the extraction process. This makes it easier to eject the portion capsule from the brewing chamber automatically. The portion capsule's version represented in Figure 19 comprises a circumferential border 16 that is placed at the wall region 12 ranging from the flange 17 to the bottom area 11, namely adjacent to the flange 17 facing towards the bottom area 11. The border 16 has an enlarged diameter (parallel to the membrane 4) compared to the wall region's ranging from the border 16 to the bottom area 11. It is provided

that the border's contour 16 is designed in such a manner that the border's diameter tapers towards the flange 7.

[00081] It is provided according to the portion capsule's embodiment, which is represented in Figure 19 and is in accordance with the invention, that the grooves 15 are placed in the border's region in the first part, partially range from the border 16 to the bottom area 11 across the wall region 12, in the second part and then finally end. All in all the grooves cover, for example, around 50 % of the extension of the wall region 12, which ranges from the flange 7 to the bottom area 11, wherein one-third of the grooves' extension is placed in the border's region and two-thirds of the grooves' extension is placed in the remaining wall region 12 that range from the border 16 to the bottom area 11.

[00082] A portion capsule according to the invention is shown as sectional view along the portion capsule's extension regarding its height in **Figure 21**, i.e. the section's plane is perpendicular to the membrane's main plane. **Figure 22** also shows a portion capsule according to the invention in a sectional view portraying the sectional plane, which is parallel to the membrane's main plane. It is noticeable that the interior of the portion capsule's cavity is shown in Figure 21. The portion capsule's material or the base element's material is so thin that the implementation of grooves at the exterior shown in Figure 19 leads to corresponding convexities and impressions at the interior. Figure 22 particularly illustrates the gearwheel shaped contour resulting from insertion of grooves in the portion capsule's wall region.

CLAIMS

1. Single-serve capsule for making a beverage, having a basic element with a cavity, in which a raw beverage material is provided, the capsule having a peripheral region which is provided on the basic element, and the cavity being closed by a membrane, which is fastened on the peripheral region of the basic element, wherein the capsule has an identifier, which makes it possible to individualize the respective single-serve capsule, characterized in that the identifier is a barcode which is provided on that side of the peripheral region of the basic element which is directed away from the membrane.

2. Single-serve capsule according to Claim 1, characterized in that a sealing surface is provided on the peripheral region and/or flange.

3. Single-serve capsule according to Claim 1, characterized in that it has an insert element with an identifier.

4. Single-serve capsule for making a beverage, having an essentially frustoconical or cylindrical basic element with a cavity for accommodating a raw beverage material, and with a membrane which closes the cavity, characterized in that the basic element has a wall region, wherein the basic element also has, on that side of the single-serve capsule which is directed away from the membrane, a base region, wherein the wall region, or the outer circumference of a flange has a plurality of channels.

5. Single-serve capsule according to Claim 4, characterized in that the channels realize an identifier, which makes it possible to individualize the single-serve capsule.

6. Single-serve capsule according to Claim 4, characterized in that at least some of the channels, and at least in a sub-region in a plane parallel to the main plane along which the membrane extends, have a gear-wheel-like contour.

7. Single-serve capsule according to Claim 4, characterized in that the channels are designed such that the wall region is stiffened by means of the channels and/or in that the channels provide for turbulence of an extraction liquid flowing in the cavity.

8. Single-serve capsule according to Claim 4, characterized in that the cavity contains a filter element, which subdivides the cavity into a first region for accommodating the raw beverage material and into a second region for accommodating a beverage extract.

9. Use of a single-serve capsule according to Claim 1 for making a hot beverage.

PORTION CAPSULE HAVING AN IDENTIFIER

ABSTRACT

A portion capsule for producing a beverage includes a base element having a cavity in which a beverage raw material is provided and which is closed by a membrane fastened to the base element.

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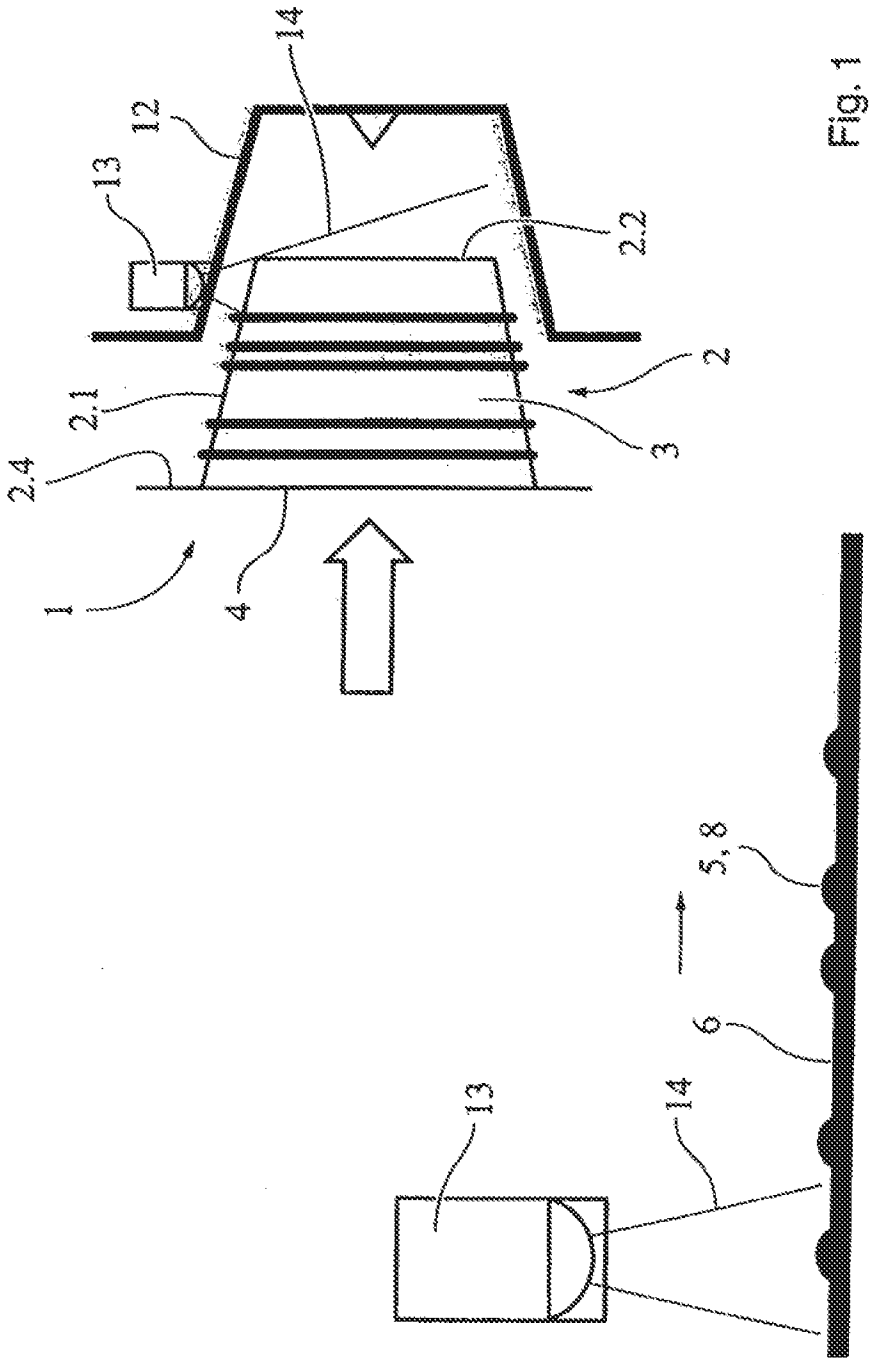


Fig. 1

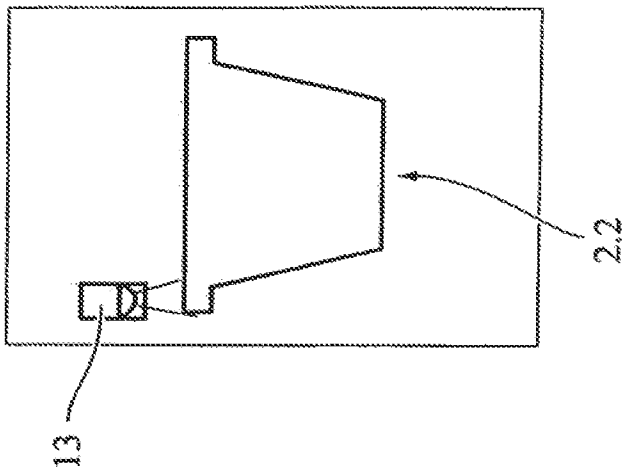
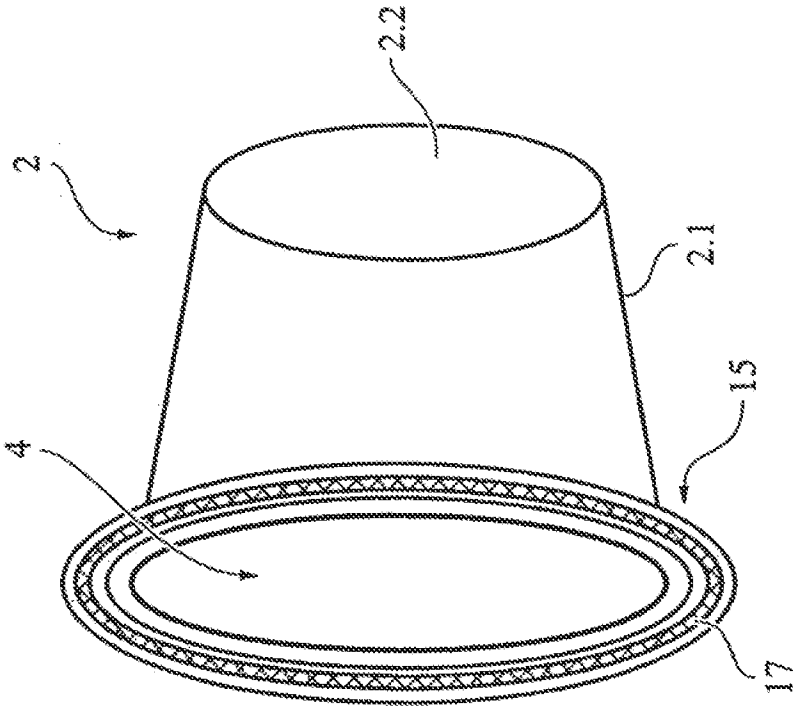


Fig. 2



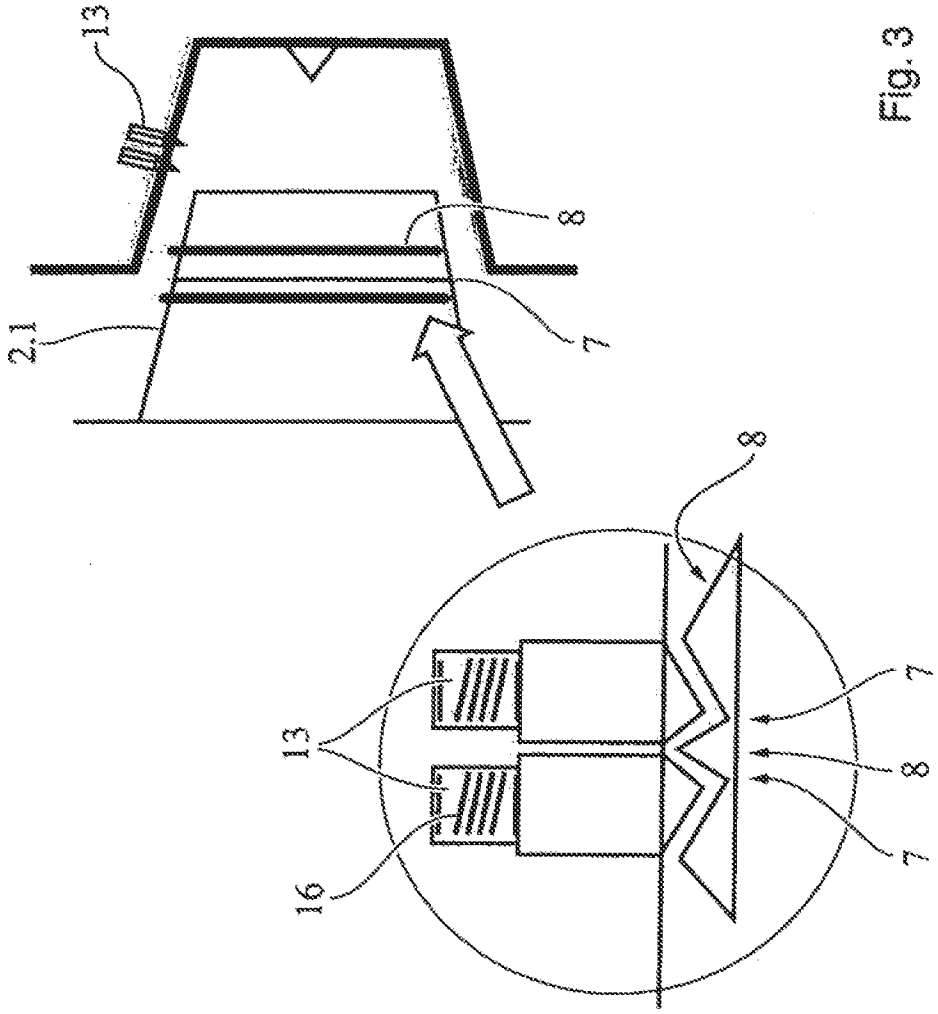


Fig. 3

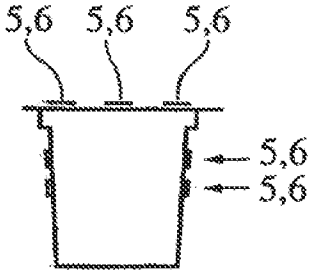


Fig. 4

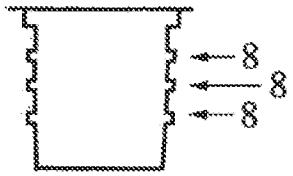


Fig. 5

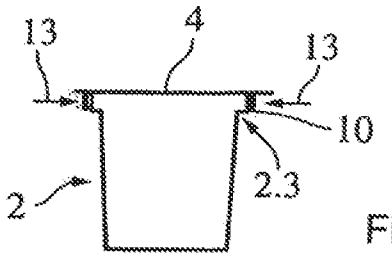


Fig. 6

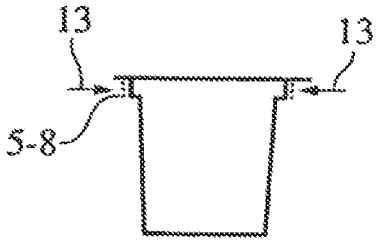


Fig. 7

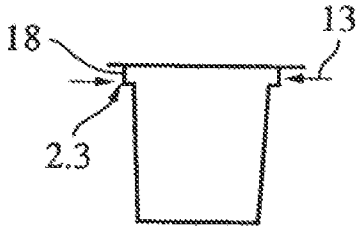


Fig. 8

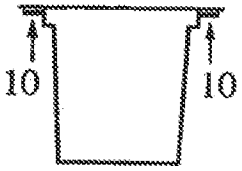


Fig. 9

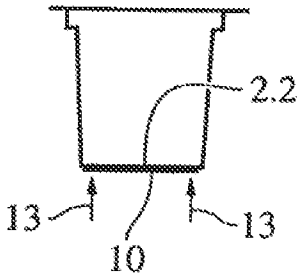


Fig. 10

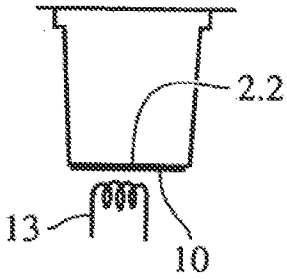


Fig. 11

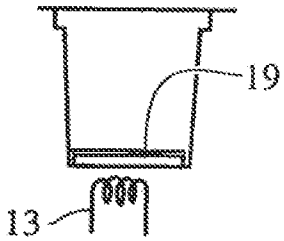


Fig. 12

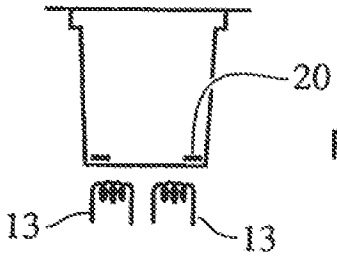


Fig. 13

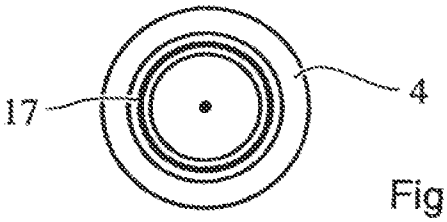


Fig. 14

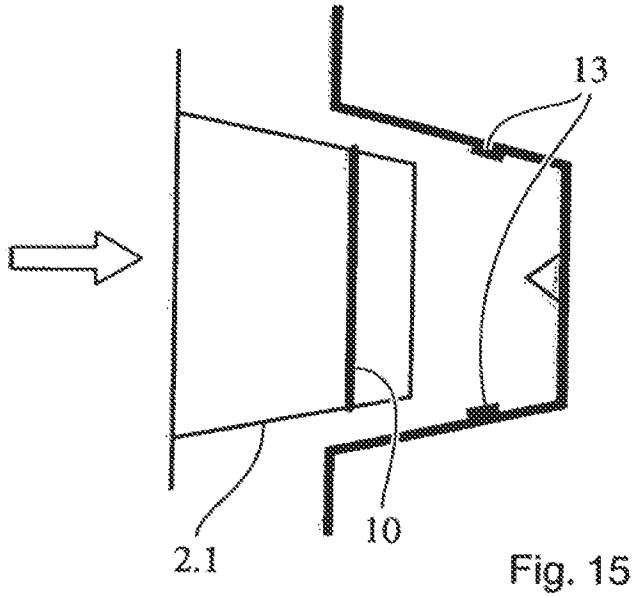


Fig. 15

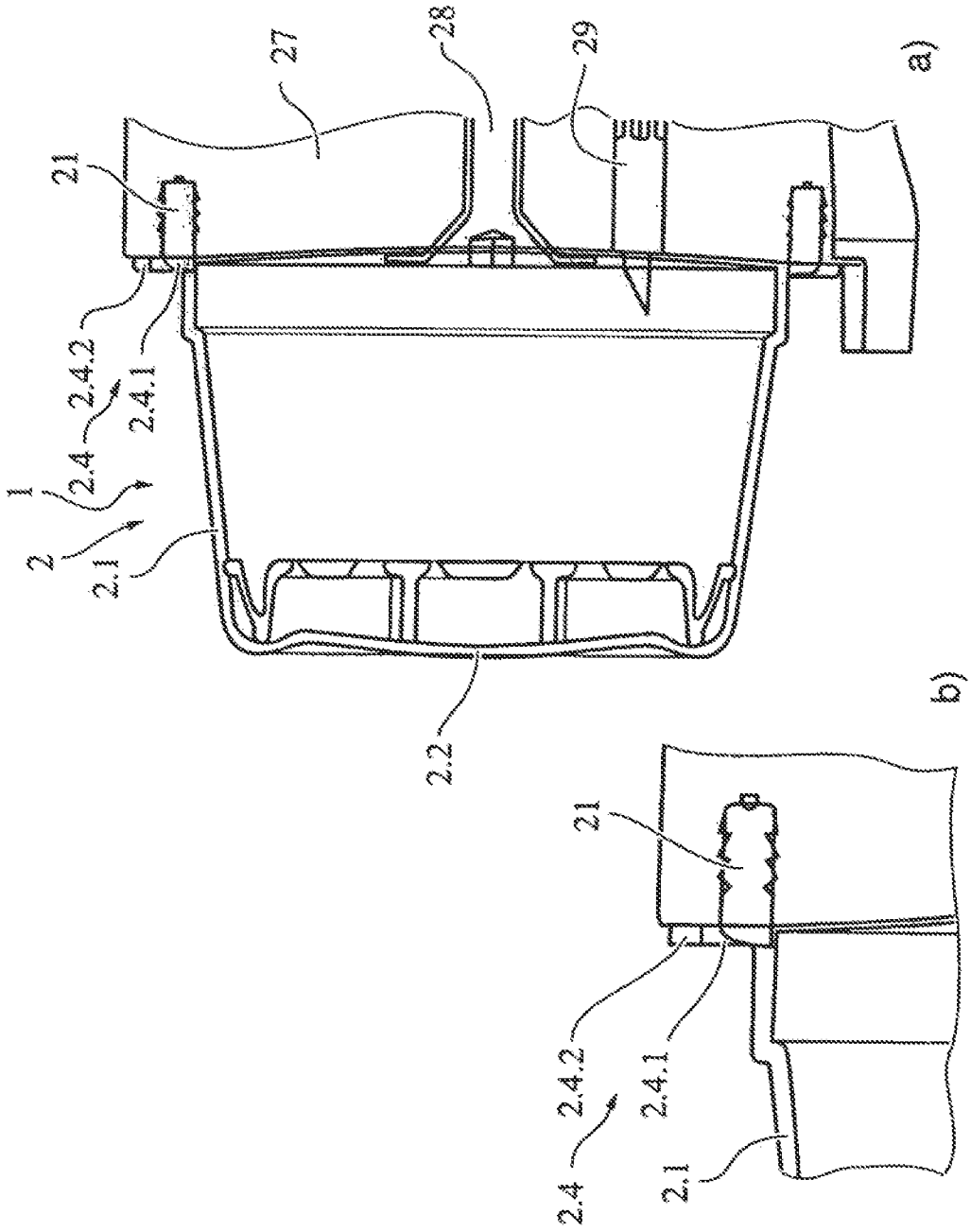


Fig. 16

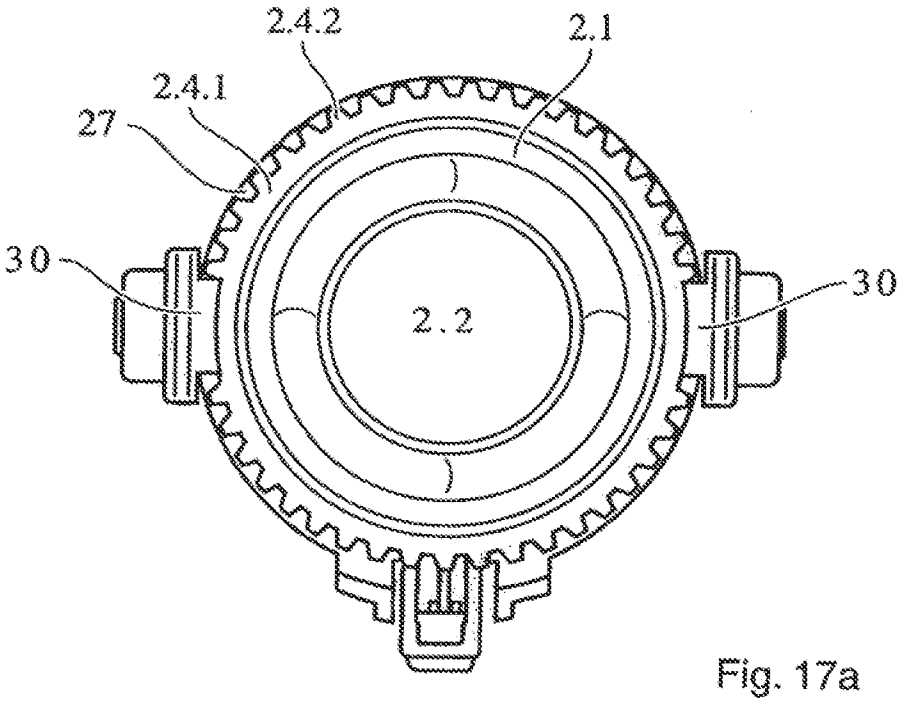


Fig. 17a

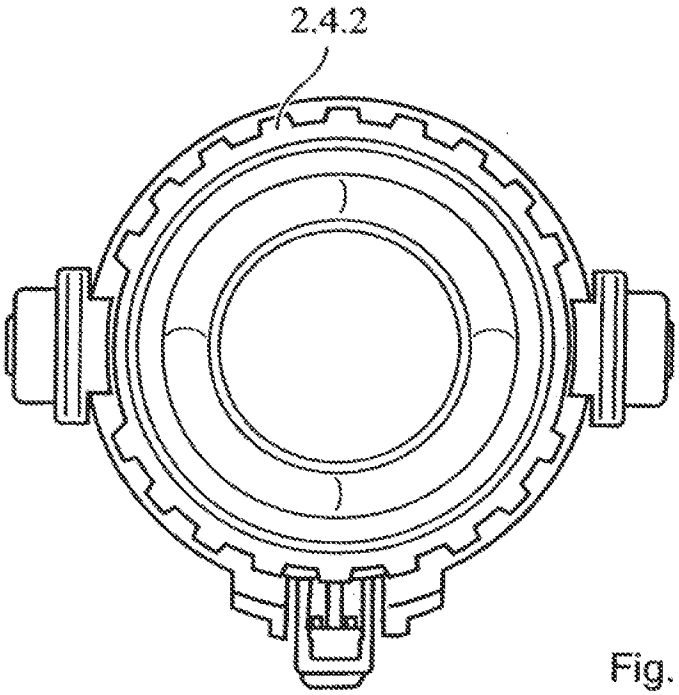


Fig. 17b

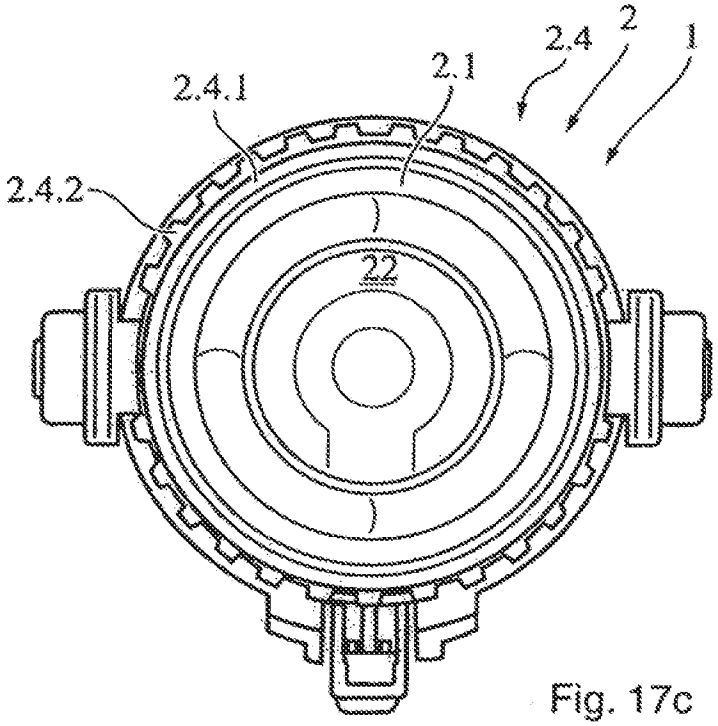


Fig. 17c

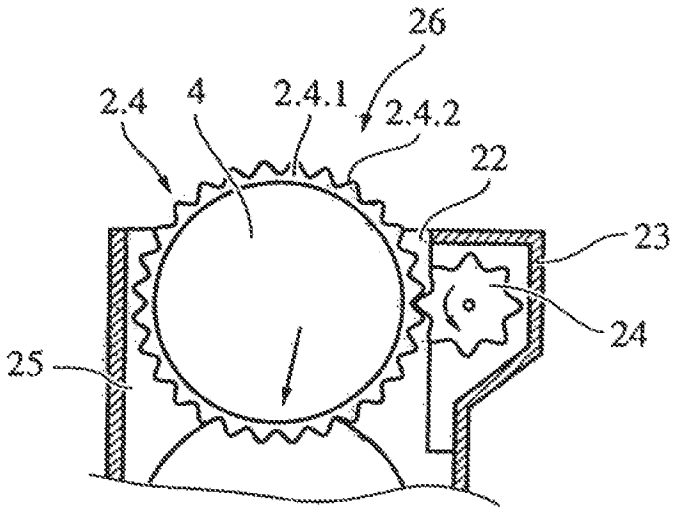


Fig. 18

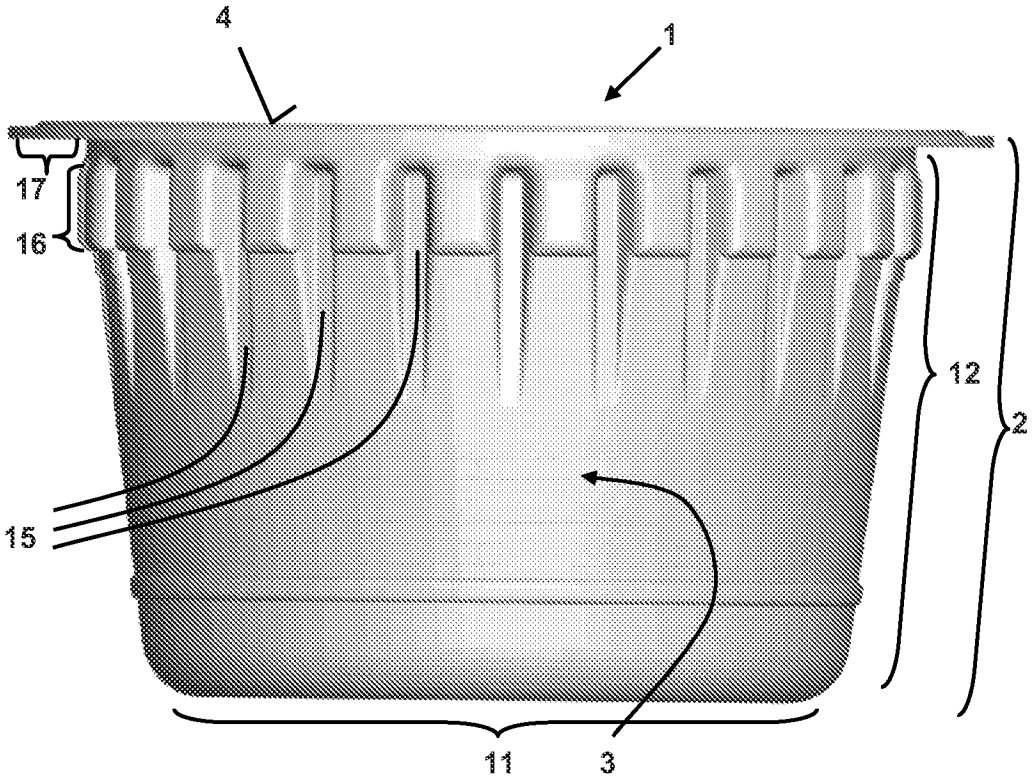


Fig. 19



Fig. 20

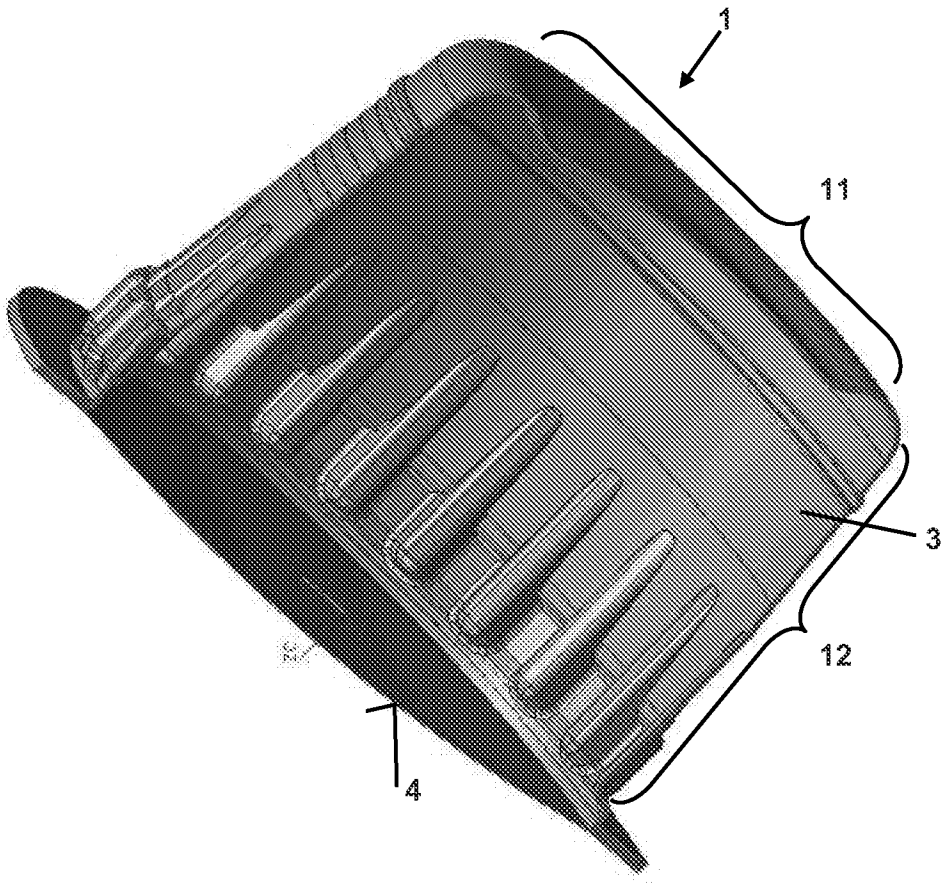


Fig. 21

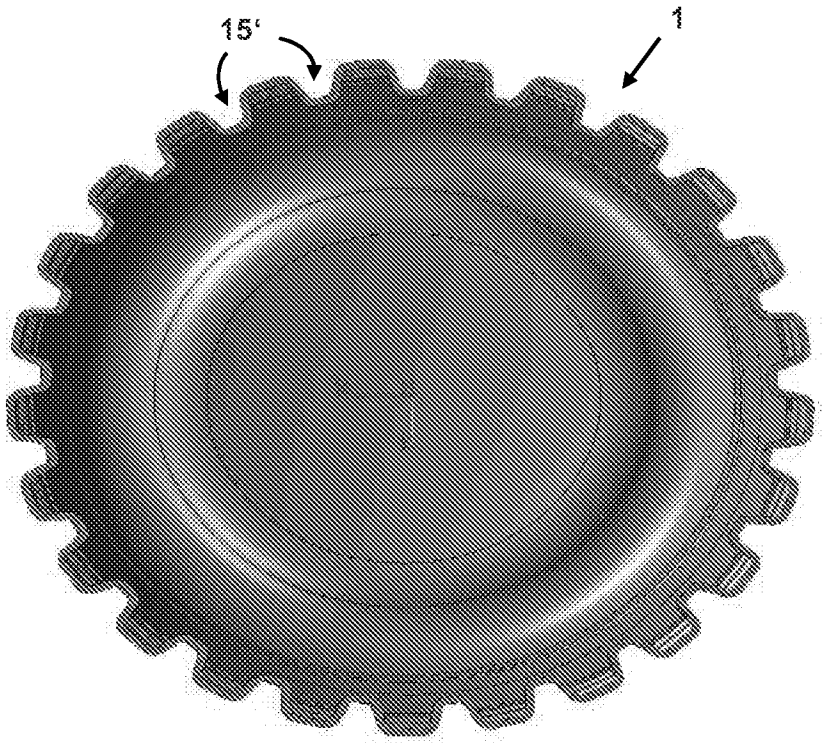


Fig. 22

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1859.029USC4
	Application Number	
Title of Invention	PORTION CAPSULE HAVING AN IDENTIFIER	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Marc		Krüger	

Residence Information (Select One) US Residency ● Non US Residency Active US Military Service

City	Bergisch Gladbach	Country of Residence i	DE

Mailing Address of Inventor:

Address 1	Zaunkönigweg 8
Address 2	

City	Bergisch Gladbach	State/Province	
Postal Code	51467	Country i	DE

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	25215		
Email Address	patmail@patentco.com	Add Email	Remove Email

Application Information:

Title of the Invention	PORTION CAPSULE HAVING AN IDENTIFIER		
Attorney Docket Number	1859.029USC4	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	12	Suggested Figure for Publication (if any)	1

IPR2023-00502
Nespresso USA, Inc. Ex. 1002 Part 1

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1859.029USC4
	Application Number	
Title of Invention	PORTION CAPSULE HAVING AN IDENTIFIER	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	◯ Limited Recognition (37 CFR 11.9)
Customer Number	25215		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	15/646980	2017-07-11

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1859.029USC4
	Application Number	
Title of Invention	PORTION CAPSULE HAVING AN IDENTIFIER	

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
15/646980	Division of	15/211823	2016-07-15
Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
15/211823	Division of	13/744623	2013-01-18
Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
13/744623	Continuation of	PCT/EP2011/003677	2011-07-22

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

			Remove
Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
10 2011 010 534.4	DE	2011-02-07	
			Remove
Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
10 2010 044 251.8	DE	2010-09-02	
			Remove
Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
10 2010 031 988.0	DE	2010-07-22	

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1859.029USC4
	Application Number	
Title of Invention	PORTION CAPSULE HAVING AN IDENTIFIER	

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1859.029USC4
	Application Number	
Title of Invention	PORTION CAPSULE HAVING AN IDENTIFIER	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1859.029USC4
	Application Number	
Title of Invention	PORTION CAPSULE HAVING AN IDENTIFIER	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	K-FEE SYSTEM GMBH		
Mailing Address Information For Applicant:			
Address 1	Senefelder Str. 44		
Address 2			
City	Bergisch Gladbach	**State/Province**	
Country	DE	Postal Code	51469
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1859.029USC4
	Application Number	
Title of Invention	PORTION CAPSULE HAVING AN IDENTIFIER	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Paul J. Palinski/			Date (YYYY-MM-DD)	2019-06-12
First Name	Paul J.	Last Name	Palinski	Registration Number	71,080

Additional Signature may be generated within this form by selecting the Add button. Add

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	1859.029USC4
	Application Number	
Title of Invention	PORTION CAPSULE HAVING AN IDENTIFIER	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Doc Code: PA..
Document Description: Power of Attorney

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POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 25215

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☑ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

K-fee System GmbH

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	21.08.2015
Name	Mark Krüger		
Title	CEO		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	PORTION CAPSULE HAVING AN IDENTIFIER

As the below named inventor, I hereby declare that:

This declaration is directed to:

- [x] The attached application, or
- [ ] United States application or PCT international application number PCT/EP2011/003677 filed on July 22, 2011

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Marc KRÜGER Date (Optional): 17.01.13

Signature: M. Krüger

Note: An application data sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/SB/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Filed via EFS @ USPTO.gov on June 12, 2019
Practitioner's Docket No. 1859.029USC4 (KRÜ0022-WO-US-T4)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Marc Krüger	Art Unit: TBA
Application No.: TBA	Examiner: TBA
Filed: Herewith	Conf. No.: TBA

For: PORTION CAPSULE HAVING AN IDENTIFIER

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Applicant submits this statement in accordance with its duty of disclosure under 37 C.F.R. §§ 1.56, 1.97, and 1.98. The submission made herewith is in no way intended as an admission that the cited items constitute material prior art or otherwise would render the claims unpatentable in any way. The submission also is in no way intended to substitute for the Examiner's own independent investigation.

Form PTO/SB/08a is submitted herewith. Copies of foreign patent documents and non-patent literature have not been provided due to their presence in the parent application to this application (see MPEP 609.02(A)(2)), and Applicant notes that this section requires the Examiner to consider all of the references previously submitted to the USPTO even if not listed in any Information Disclosure Statement filed in this application. Applicant is resubmitting these references on the attached form PTO/SB/08a so that all of the references are listed on the face of the patent. However, to the extent that any references have been inadvertently overlooked, or otherwise are not resubmitted on this form, Applicant respectfully requests consideration of the previously submitted references as is set forth in MPEP 609.02(A)(2) and inclusion of such references on the face of the patent. Applicant respectfully solicits the Examiner's consideration of the cited references and entry thereof into the record of this application.

This Information Disclosure Statement is being submitted prior to the mailing of a first Office Action or Notice of Allowance. No fees are believed to be due; however, if any fee is due with the filing of this paper, please charge the amount to Deposit Account 50-1097.

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	Application Number	TBA
	Filing Date	Herewith
	First Named Inventor	Marc Krüger
	Art Unit	TBA
	Examiner Name	TBA
	Attorney Docket Number	1859.029USC4 (KRÜ0022-WO-US-T4)

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	TBA
	Filing Date	Herewith
	First Named Inventor	Marc Krüger
	Art Unit	TBA
	Examiner Name	TBA
	Attorney Docket Number	1859.029USC4 (KRÜ0022-WO-US-T4)

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	Attorney Docket Number	1859.029USC4 (KRÜ0022-WO-US-T4)

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	Examiner Name	TBA
	Attorney Docket Number	1859.029USC4 (KRÜ0022-WO-US-T4)

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NON-PATENT LITERATURE DOCUMENTS			
Examiner Initial*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1.	Rawle, Alan, "Particle Sizing – An Introduction" 2012; Silver Colloids, Edition or volume on Colloidal Silver	
	2.	Decision on Appeal before the Patent Trial and Appeal Board for Appeal No. 2017-007984 dated May 10, 2019.	
	3.	Notice of Opposition regarding EP3023362 filed July 30, 2018.	
	4.	Search Report for CN201180035944 mailed September 25, 2014.	
	5.	First Office Action for Application No. CN201180035944 mailed October 10, 2014.	
	6.	Second Office Action for Application No. CN201180035944 mailed April 21, 2015.	
	7.	Third Office Action for Application No. CN201180035944 mailed November 12, 2015.	

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	First Named Inventor	Marc Krüger
	Art Unit	TBA
	Examiner Name	TBA
	Attorney Docket Number	1859.029USC4 (KRÜ0022-WO-US-T4)

	8.	Notification to Grant Patent for Application No. CN201180035944 mailed May 25, 2016.	
	9.	Search Report for CN201610644043 mailed May 11, 2018	
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	11.	Search Report and Written Opinion for PCT/EP2011/003677 mailed July 22, 2011.	
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	13.	Office Action for Application No. EP 15174333.3 dated August 16, 2016. (EP2952453)	
	14.	Search Report and Written Opinion for Application No. EP 15173071.0 dated November 5, 2015. (EP2957525)	
	15.	Office Action for Application No. EP 15173071.0 dated November 5, 2015. (EP2957525)	
	16.	Third party observation for Application No. EP2957525 dated September 30, 2016.	
	17.	Search Report and Written Opinion for Application No. EP 15197332.8 dated April 12, 2016. (EP3023361)	
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	19.	Second Office Action for Application No. EP 15197332.8 dated May 24, 2017. (EP3023361)	
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	21.	Search Report and Written Opinion for Application No. EP 15197336.9 dated April 4, 2016 (EP3023362)	
	22.	Search Report and Written Opinion for Application No. EP 15197338.5 dated April 7, 2016 (EP3023363)	
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	24.	First Office Action for Application No. JP 2013-520009 dated December 10, 2014. (JP5946828)	
	25.	Second Office Action for Application No. JP 2013-520009 dated August 19, 2015. (JP5946828)	
	26.	Decision to Grant for Application No. JP 2013-520009 dated April 28, 2016. (JP5946828)	
	27.	Search Report for Application No. JP 2016-032427 dated November 21, 2016. (JP2016163691)	
	28.	First Office Action for Application No. JP 2016-032427 dated November 28, 2016. (JP2016163691)	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	Marc Krüger
	Art Unit	TBA
	Examiner Name	TBA
	Attorney Docket Number	1859.029USC4 (KRÜ0022-WO-US-T4)

	29.	Second Office Action for Application No. JP 2016-032427 dated June 20, 2017. (JP2016163691)	
	30.	Search Report for Application No. JP 2017-034769 dated November 15, 2017. (JP2017148511)	
	31.	Office Action for Application No. JP 2017-034769 dated January 30, 2018. (JP2017148511)	
	32.	Office Action for Application No. KR 10-2013-7004356 dated April 5, 2018. (KR20137004356)	
	33.	Office Action for Application No. 10-2017-7019956 dated April 10, 2018. (KR20170087528)	

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.			

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/438,818

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	300
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	660
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	760
TOTAL CLAIMS (37 CFR 1.16(i))	9 minus 20 =	*			OR	x 100 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 460 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1720

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/438,818	06/12/2019	3761	1720	1859.029USC4	9	2

CONFIRMATION NO. 8813

FILING RECEIPT

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The Dobrusin Law Firm P.C.
29 W. Lawrence Street, Ste. 210
SUITE 210
PONTIAC, MI 48342

OC000000109022357

Date Mailed: 06/19/2019

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

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Inventor(s)

Marc Krüger, Bergisch Gladbach, GERMANY;

Applicant(s)

K-FEE SYSTEM GMBH, Bergisch Gladbach, GERMANY;

Power of Attorney: The patent practitioners associated with Customer Number 25215

Domestic Priority data as claimed by applicant

This application is a CON of 15/646,980 07/11/2017
which is a DIV of 15/211,823 07/15/2016
which is a DIV of 13/744,623 01/18/2013 ABN
which is a CON of PCT/EP2011/003677 07/22/2011

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
GERMANY 10 2011 010 534.4 02/07/2011
GERMANY 10 2010 044 251.8 09/02/2010
GERMANY 10 2010 031 988.0 07/22/2010

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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If Required, Foreign Filing License Granted: 06/18/2019

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/438,818**

Projected Publication Date: 09/26/2019

Non-Publication Request: No

Early Publication Request: No

Title

PORTION CAPSULE HAVING AN IDENTIFIER

Preliminary Class

099

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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Practitioner's Docket No. 1859.029USC4 (KRÜ0022-WO-US-T4)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Marc Krüger	Art Unit: 1792
Application No.: 16/438,818	Examiner: Becker, Drew E.
Filed: June 12, 2019	Conf. No.: 8813

For: PORTION CAPSULE HAVING AN IDENTIFIER

Commissioner for Patents
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SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Applicant submits this statement in accordance with its duty of disclosure under 37 C.F.R. §§ 1.56, 1.97, and 1.98. The submission made herewith is in no way intended as an admission that the cited items constitute material prior art or otherwise would render the claims unpatentable in any way. The submission also is in no way intended to substitute for the Examiner's own independent investigation.

Copies of foreign patent documents and non-patent literature together with a listing on form PTO/SB/08a are submitted herewith. Applicant includes English translations from the European Patent Office website and are subject to the caveat expressed on the translations. Applicant respectfully solicits the Examiner's consideration of the cited references and entry thereof into the record of this application.

This Information Disclosure Statement is being submitted prior to the mailing of a first Office Action or Notice of Allowance. No fees are believed to be due; however, if any fee is due with the filing of this paper, please charge the amount to Deposit Account 50-1097.

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Examiner Signature		Date Considered	
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(54) Beverage preparation cartridge.

(57) A beverage package (1) containing one or more beverage preparation ingredients and being formed from substantially air- and water-impermeable materials, the said package comprising a compartment (2) containing the beverage preparation ingredient(s), an inlet (12) which communicates with the said compartment and an outlet (3), a filter (9) being disposed between the compartment and at least a part of the under surface (5) of the top of the package, one or more passages (15) being formed between the filter and the top of the package, which passage(s) communicate with the outlet whereby, in use, a liquid medium is passed into the compartment containing the beverage preparation ingredient(s), filtered upwardly through the filter and collected through the outlet.

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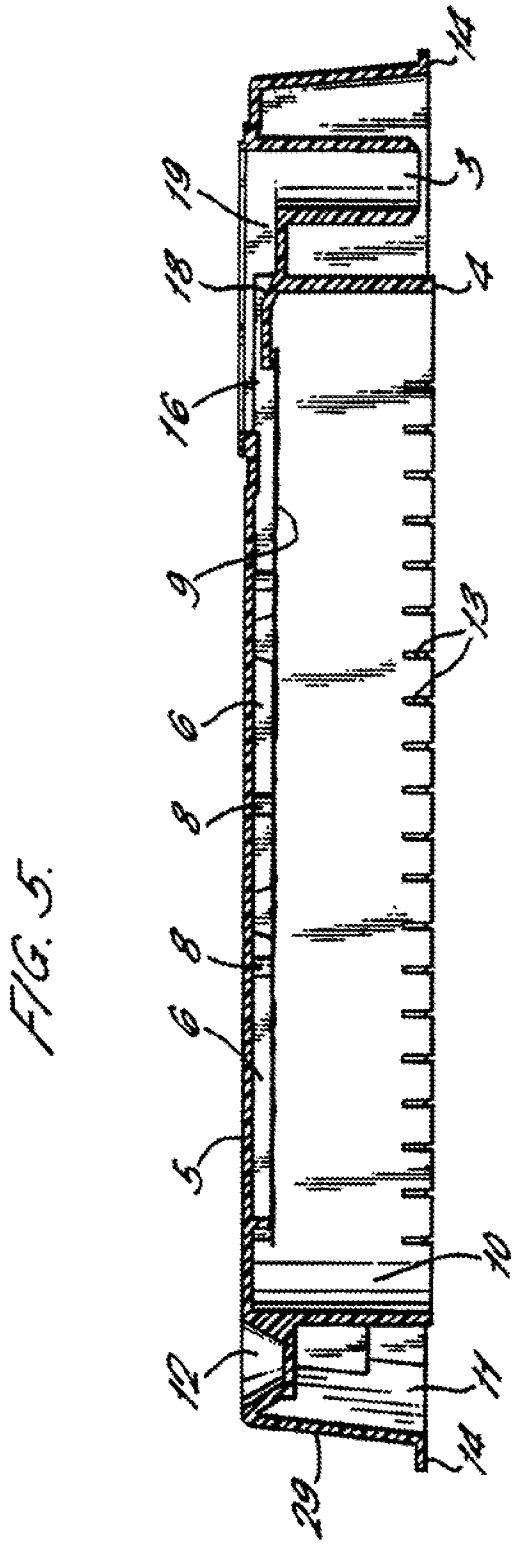


FIG. 5.

The present invention relates to packages containing ingredients for the preparation of beverages and, in particular, to sealed packages which are formed from a substantially air- and water-impermeable material and which contain one or more ingredients for the preparation of beverages.

It has previously been proposed to seal beverage preparation ingredients in individual air-impermeable packages. For example, cartridges or capsules containing compacted ground coffee are known for use in certain coffee making machines which are generally termed "espresso" machines. In the production of coffee using these coffee machines the coffee cartridge is placed in a brewing chamber and hot water is generally caused to pass under pressure through the cartridge, thereby extracting the aromatic coffee constituents from the ground coffee and producing a coffee beverage.

Cartridges containing roast and ground coffee in which hot water flows under gravimetric force through the cartridge are also known. A cartridge of this general type is described in British Patent No. 1397116.

In our European Patent Application No. 87311325.2 there is described a package which contains at least one beverage preparation ingredient, e.g. roast and ground coffee. In a preferred embodiment the package is formed from a substantially air- and water-impermeable material and comprises a sealed body portion having a compartment containing the beverage ingredient and an outlet channel, the compartment and the outlet channel co-operating in such a manner that, in use, the beverage is filtered, thereby avoiding the necessity for an external filter.

There is also described in European Patent Application No. 87311325.2, a method for preparing a beverage which comprises positioning a beverage containing package at a brewing station, introducing water through water introduction means into the package, allowing the water to commingle with the beverage ingredient, and collecting the beverage so-formed through an outlet formed in the package.

The beverage packages as described in European Patent Application No. 87311325.2 are primarily intended to be used with a beverage preparation machine which handles the packages automatically or semi-automatically. A machine of this type is described in our European Patent Application No. 89302708.6. The packages may contain roast and ground coffee, leaf tea or one or more powdered beverage preparation ingredients such as powdered chocolate, powdered coffee or powdered soup.

We have now developed a package containing one or more ingredients for the preparation of beverages in which a filter is disposed in such a manner that the beverage so produced is filtered upwardly through the filter.

Accordingly, the present invention provides a beverage package containing one or more beverage preparation ingredients and being formed from substantially air- and water-impermeable materials, the said package comprising a compartment containing the beverage preparation ingredient(s), an inlet which communicates with the said compartment and an outlet, a filter being disposed between the compartment and at least a part of the under surface of the top of the package, one or more passages being formed between the filter and the top of the package, which passage(s) communicate with the outlet whereby, in use, a liquid medium is passed into the compartment containing the beverage preparation ingredient(s), filtered upwardly through the filter and collected through the outlet.

The beverage package of the present invention preferably has a body portion which may be formed, for example, from a moulded plastics material. The inlet and/or outlet of the package may be closed by a plug of a plastics material moulded into the inlet and/or outlet nozzle during the moulding of the body portion. Alternatively, the inlet and/or outlet may be covered by a substantially air- and water-impermeable material, for example aluminium foil or a laminated material, such as a laminate of plastic material/metal foil/plastic material, prior to the opening of the inlet and/or outlet. Specific examples of materials which can be used are aluminium foil having a thickness in the range of from 30 to 60 micrometres coated with a layer of polypropylene or a laminate of polypropylene/aluminium foil/polyester.

The outlet in the package may be prepared during the beverage preparation cycle using a cutting and piercing tool for example of the type as described in our European Patent Application No. 89302708.6.

Alternatively, the inlet and/or outlet may be open and the beverage package provided with an outer wrapping or the like. For example, a plurality of packages may be provided with a shrink wrapped outer layer.

In the packages of the present invention, the communication between the inlet and the compartment containing the beverage preparation ingredient(s) is preferably via a channel which is separated from the compartment by a wall which has a plurality of openings formed therein for the entry of a liquid medium into the compartment. The channel preferably extends along at least one side of the compartment, more preferably along three sides of the compartment. The openings in the wall are preferably in the form of elongate slots which are generally arranged in a manner such that an even distribution of the liquid medium through the beverage preparation ingredients is acheived.

The filter is preferably made from a material with a high wet strength, for example a non-woven polyester fibre material or polypropylene. Other materials which may be used include a water-permeable cellulosic material, such as a cellulosic material compris-

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ing woven paper fibres. The woven paper fibres may be admixed with fibres of polypropylene, polyvinylchloride and/or polyethylene. The incorporation of these plastics materials into the cellulosic material renders the cellulosic material heat-sealable. The filter material may also be coated with a material which is activated by heat and/or pressure so that it can readily be sealed to ribs formed in the under surface of the top of the package, thereby forming one or more passages which communicate with the outlet.

The beverage preparation ingredients contained in the packages of the invention are preferably roast and ground coffee, or leaf tea, and according to individual taste, powdered milk or creamer, sugar or artificial sweetner.

It will be understood that it may be convenient for the compartment containing the beverage preparation ingredients to be separated into two or more sections, for example, one section containing roast and ground coffee and another section containing powdered milk or creamer. In such an arrangement the means for the entry of the liquid medium into the separate compartments would be varied to suit the requirements for filtration or dissolution of the particular ingredients.

The package of the present invention, when filled with roast and ground coffee, preferably contains from 2.5 to 10 grams of roast and ground coffee, preferably from 4.5 to 6 grams for the preparation of a single cup. However, packages which are intended to provide multiple servings of coffee will contain an appropriate amount of roast and ground coffee, for example, packages intended to provide say five cups of coffee will contain from 20 to 50 grams of roast and ground coffee, preferably from 25 to 30 grams. The roast and ground coffee is generally compacted when the beverage package is filled in order to aid the distribution and transport of water through the package.

In use of the beverage packages of the present invention a liquid medium is passed via the inlet of the package into the compartment containing the beverage preparation ingredient(s). The filter is disposed at the top of the compartment containing the beverage preparation ingredient(s) and the liquid medium is thereby caused to flow upwardly through the beverage preparation ingredients. The beverage so formed flows upwardly through the filter into the passage or passages which communicate with the outlet.

Filtering the beverage in an upwardly direction has been found to be advantageous in that the smaller and lighter particles of the beverage preparation ingredients settle to the bottom of the compartment and hence the clogging of the filter by these small particles is mitigated. The beverage thus filters more rapidly upwardly through the filter than it would if the filter were placed beneath the beverage ingredients and the liquid medium caused to flow in a downwardly direction. Furthermore, the flow of water in an upwardly direction through the package is advantageous in that the particles of the beverage preparation ingredient(s) float up towards the filter, thereby re-establishing the filter bed. This is of particular advantage if the particles of the beverage preparation ingredient(s) have settled during transport and/or storage and if holes or cracks have formed in the bed. The upward filtration causes the filter bed to re-establish in these situations, thereby providing a more effective filtration of the beverage preparation ingredient(s). With regard to the preparation of a beverage from tea leaves the upward filtration is particularly advantageous because the tea leaves float initially and then sink and the configuration of the beverage packages of the present invention prevents the wetted tea leaves from blinding the filter.

The quality of the filtration of beverage preparation ingredients, in particular roast and ground coffee, is known to affect the flavour of the beverage. The brewing and flavour characteristics for roast and ground coffee charge with the roasting and grinding conditions and are effected by the size and shape of the particles. The beverage packages of the present invention enable efficient filtration to be achieved and thereby give rise to beverages which have little or no turbidity and a good flavour.

Another advantage of the package of the present invention is that with the continuous flow of water in an upwardly direction through the package a more effective wetting of the beverage preparation ingredient(s) is achieved. This is of importance for roast and ground coffee since the wetting of the particles causes the particles to swell and thus assists in preventing fine particles from passing through the filter. It will be appreciated that for the preparation of coffee from roast and ground coffee, or the preparation of tea from leaf tea, the liquid medium is hot water.

The present invention also includes within its scope a method for the preparation of a beverage from a sealed package containing one or more beverage preparation ingredients located in a compartment in the package, which method comprises introducing a liquid medium suitable for the preparation of the beverage under pressure into the package through an inlet formed therein, causing the liquid medium to enter the compartment thereby forming the beverage, filtering the beverage in an upwardly direction through a filter, and collecting the beverage so formed from an outlet formed in the package.

The packages of the present invention are preferably provided with a recognition means whereby, in use, the package is identified by the machine into which it is placed for treatment and the identification of the package thereby causes it to be subjected to the correct treatment steps including the introduction of a liquid medium into the package. For the preparation of beverages from beverage preparation ingredients the liquid medium introduced into the package

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will generally be water or a water/air mixture.

The recognition means may comprise one or more surface features formed in the body of the beverage package. For example, the package body may be provided with one or more indents, cut outs, protrusions or holes which can be identified by a mechanical sensor in the beverage preparation machine, the mechanical sensor registering the presence or absence of the indents, cut outs, protrusions or holes.

The recognition means may, alternatively, comprise a system which can be sensed by a simple optical device, for example a bar code printed onto the body of the package, a pattern of through holes in the package, a pattern of contrasting tones or colours printed onto the package or packages containing different comestibles being of different colours.

The recognition means may also comprise one or more strips of a magnetic material applied to the body of the package which can be read by an appropriate magnetic sensor; one or more shaped or divided areas of metal foil applied to the package body which cause an inductive effect on movement of the package in the machine, which inductive effect can be sensed; or one or more electrically conductive areas formed on the body of the package which can be sensed electrically.

As mentioned above, the package of the present invention contains one or more beverage preparation ingredients, for example, roast and ground coffee or leaf tea and sugar and/or creamer, as desired. One machine which can readily be adapted for the preparation of a beverage from the preferred beverage package of the invention which includes a recognition means is described in our European Patent Application No. 89302708.6. The only modification required to be made to such a beverage preparation machine is to incorporate an appropriate sensor or sensors into it, the sensor or sensors being designed to read the particular coding on the capsule and to send a signal to the controller, which then selects the appropriate beverage preparation cycle.

The recognition system used on the beverage packages of the present invention enables a single beverage preparation machine to prepare from different beverage packages a great number of different beverages which require different beverage preparation conditions.

The packages of the present invention may be treated by a machine which includes therein one or more sensors which are adapted to sense and identify a recognition means provided on a package inserted into the machine.

The sensor may be, for example, a mechanical sensor, an optical sensor, a magnetic sensor, an electrical sensor or an inductive sensor. The machine is preferably adapted so that the package is handled automatically following its insertion into the machine. For example, a machine of the type as described in our European Patent Application No. 89302708.6 can be fitted with an appropriate sensor to sense and identify a recognition means provided on beverage packages intended for use therewith.

The present invention will be further described with reference to the accompanying drawings, in which:-

Figure 1 is a perspective view of part of a beverage package of the invention;

Figure 2 is a top plan view of the beverage package of Figure 1;

Figure 3 is a section through the beverage package of Figure 1 along line A-A of Figure 2;

Figure 4 is a section through the beverage package of Figure 1 along line B-B of Figure 2; and

Figure 5 is a section along the line C-C of Figure 2;

Referring to the drawings a beverage package body is shown at 1. The body may be formed, for example, from a moulded plastics material. The body 1 has a compartment 2 in which the beverage preparation ingredient or ingredients are contained. The package body has an outlet nozzle 3 and an inlet 12 formed therein. The compartment 2 is separated from the area of the body in which the nozzle 3 is formed by means of a wall 4. The top 5 of the package 1 has four longitudinal ribs 6 moulded to the underside thereof which are shown as a plurality of dotted lines in Figure 2. The four ribs 6 are joined at either end by transverse ribs 7 which are also shown in dotted outline in Figure 2. The ribs 6 and 7 are strengthened at intervals by posts 8 which are also moulded to the underside of the top 5 of package 1. These posts 8 are also shown in dotted outline in Figure 2. A filter material 9 is heat sealed to ribs 6, ribs 7 and posts 8, the filter material 9 extends across a substantial part of the top of compartment 2.

Compartment 2 is separated from the outlet nozzle by a wall 4 and surrounded on its other three sides by a U-shaped wall 10. The wall 10 has a U-shaped channel 11 surrounding it, the channel 11 communicating with inlet 12. The wall 10 has a plurality of small slots 13 formed in the two longitudinal arms thereof.

In use of the beverage package as shown in the drawings, the bottom of the package 1 is sealed by means of an aluminium foil or a laminated foil which is heat sealed to the lower edges of walls 4 and 10 and to the lower edge 14 of the package. Water enters the package at a pressure of about 10^5Pa via inlet 12 which is opened by piercing or cutting the material covering the said opening. The water enters the channel 11 surrounding three sides of the compartment 2 containing the beverage ingredients. The water, which is under pressure, is forced through the elongate slots 13 formed in the wall 10 which separates channel 11 from compartment 2. The water mixes with the beverage preparation ingredients contained in

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compartment 2 and is forced upwardly through the beverage preparation ingredients. The beverage formed by passage of the water through the beverage preparation ingredients passes through filter material 9 into passages 15 which are formed between the ribs 6. The sealing of the filter material 9 onto ribs 6 and 7 prevents any short circuit and all of the beverage has to pass through the filter. The passages 15 are closed at the end remote from the outlet by transverse rib 7. The beverage formed by the passage of water through the beverage preparation ingredients also passes directly through the filter material 9 into areas 16 which communicate with passages 15. The beverage passes along passages 15, commingles with the beverage collected in areas 16 and is then funnelled by means of angled extensions 17 of the middle two ribs 6 over a weir 18 to a beverage collection area 19 and thence into outlet nozzle 3. The beverage is then collected in a cup or other receptacle placed below the outlet nozzle 3. It may be desirable to support the filter material 9 by means of additional support ribs in the passages 15 in order to prevent the filter material from bowing and sealing the passages.

Additional strengthening of the package of the invention is provided in the area adjacent the outlet nozzle, as best shown in Figure 4, by a hollow post 20 which is attached by ribs 21 arranged in cruciform fashion to the end wall 22, side wall 27 and wall 4.

Using the beverage package as illustrated in Figures 1 to 5 it is possible to prepare 160 ml of coffee from roast and ground coffee contained in compartment 2 in 20 seconds by passing water at a pressure of 10^5Pa through the package.

The beverage package as illustrated in Figures 1 to 5 incorporates the recognition means which is a preferred feature of the invention. The package of the invention 1 containing one or more beverage preparation ingredients has a generally rectangular shape with flat top and bottom surfaces and is thereby suitable for insertion into a beverage preparation machine, for example of the type as described in our European Patent Application No. 89302708.6, longitudinally through a slot.

The package is also provided, as best shown in Figure 2, with teeth 25 moulded along one side wall of compartment 2. The teeth 25 have recesses 26 formed therebetween. These teeth 25 are intended to enable the beverage package to be driven through a beverage preparation machine by the engagement of the teeth 25 with the tooth of a cam (not shown). The side wall 27 of the beverage package has a flange 28 extending at right angles thereto. The flange 28 has an upstanding rib 30 at the end thereof near to the leading end 29 of the package.

As the package is driven into the beverage preparation machine the flange 28 is sensed as the side edge of the package passes beneath a sensing arm (not shown). The flange 28 has a plurality of upstanding pegs 31,32,33,34 located therein and as the package is driven into the machine by the engagement of the teeth 25 with the tooth of a cam, the sensor senses the presence or absence of upstanding pegs 31,32,33,34.

If one or more of pegs 31,32,33,34 is not present the sensing arm will thereby identify a different type of beverage package. The sensing arm operates a switch (not shown) which thereby transmits information concerning the presence or absence of the pegs on the package to the control mechanism for the beverage dispensing machine. The arrangement of pegs 31,32,33,34 on the package thus identifies the type of package to the controller which then selects the appropriate beverage preparation conditions.

The presence or absence of three pegs provides scope for the sensing arm to sense up to 8 different types of beverage packages. Thus, if the presence of a peg at a particular location is coded as 1 and the absence of a peg coded as 0, the following code combinations can be achieved.

000
001
010
100
101
110
011
111

The presence of the additional fourth peg formed in flange 28 provides an even larger number of code combinations.

When the beverage preparation machine has selected the appropriate beverage preparation conditions, the water inlet 12 of the package is pierced or cut, the outlet 3 is uncovered in the package and water caused to flow under pressure through the compartment containing the beverage ingredient(s). The chosen beverage then being collected in a cup or receptacle placed below the outlet 3 of the package.

It will be appreciated that for different types of packages the beverage or other ingredient may require significantly different treatment. Thus, some beverages will be prepared with hot water and some with cold water, whilst others, such as espresso coffee, will require a smaller amount of water for their preparation. Preparation times may require to be varied. Similarly water and/or air may be required either for preparing/dispensing the beverage/content of the package or for the purpose of pre-cleaning an inlet pipe or flushing out a used package. Furthermore, a user may require a particular beverage to be dispensed in combination with one or more ingredients from independent sources, e.g. powdered milk and/or sugar.

The present invention will be further illustrated with reference to the following non-limiting Example

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EXAMPLE

The following experiments were conducted in respect of the preparation of beverages from coffee capsules, adapted for upward or downward filtration, which had been subject to vibration during transport and distribution. The capsules were each tapped prior to the preparation of the beverages.

Downward Filtration

Sample 1

6.3g of roast and ground coffee contained in a capsule adapted for downward filtration gave 153cc of a coffee beverage at 0.8% solids with a yield of 19.4%.

Sample 2

6.3g of roast and ground coffee contained in a capsule adapted for downward filtration gave 153cc of a coffee beverage at 0.81% solids with a yield of 19.7%.

Upward Filtration

Sample 3

6.3g of roast and ground coffee contained in a capsule adapted for upward filtration, when brewed in the same manner as for samples 1 and 2, gave 156cc of a coffee beverage at 1.04% solids with a yield of 25.7%.

Sample 4

6.3g of roast and ground coffee contained in a capsule adpated for upward filtration, when brewed in the same manner as for samples 1 and 2, gave 158cc of a coffee beverage at 1.02% solids with a yield of 25.6%.

These results indicate an improvement of approximately 20% yield.

Claims

1. A beverage package containing one or more beverage preparation ingredients and being formed from substantially air- and water-impermeable materials, the said package comprising a compartment containing the beverage preparation ingredient(s), an inlet which communicates with the said compartment and an outlet, a filter being disposed between the compartment and at least a part of the under surface of the top of the package, one or more passages being formed between the filter and the top of the package, which passage(s) communicate with the outlet whereby, in use, a liquid medium is passed into the compartment containing the beverage preparation ingredient(s), filtered upwardly through the filter and collected through the outlet.

2. A package as claimed in claim 1 wherein the inlet and/or outlet is covered by a substantially air- and water-impermeable material prior to the formation, in use, of an outlet in the package.

3. A package as claimed in claim 1 wherein the inlet and/or outlet is closed by a plug prior to the formation, in use, of an outlet in the package.

4. A package as claimed in any one of the preceding claims wherein a channel communicates with the inlet for the entry of a liquid medium into the package, the channel being separated from the compartment by a wall which has a plurality of openings formed therein for the entry of the liquid medium into the compartment containing the beverage preparation ingredient(s).

5. A package as claimed in claim 4 wherein the channel extends along at least one side of the compartment containing the beverage preparation ingredient(s).

6. A package as claimed in claim 4 or claim 5 wherein the channel extends around three sides of the compartment containing the beverage preparation ingredient(s).

7. A package as claimed in any one of the claims 4 to 6 wherein the openings comprise a plurality of elongate slots.

8. A package as claimed in any one of the preceding claims wherein the filter is made from a water-permeable material.

9. A package as claimed in any one of the preceding claims wherein a plurality of passages are formed between the filter and the top of the package.

10. A package as claimed in any one of the preceding claims wherein the beverage preparation ingredient is leaf tea or roast and ground coffee.

11. A package as claimed in any one of the preceding claims which is provided with a recognition means whereby, in use, the package is identified by the machine into which it is placed for treatment therefrom and the identification of the package thereby causes it to be subjected to the correct treatment steps including the introduction of a fluid medium into the package.

12. A package as claimed in claim 11 wherein the recognition means comprises one or more surface features formed in the body of the package.

13. A package as claimed in claim 11 wherein the rec-

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ognition means comprises a bar code.

14. A package as claimed in claim 11 wherein the recognition means comprises a pattern of holes formed in the body of the package.

15. A package as claimed in claim 11 wherein the recognition means comprises a pattern of contrasting tones or colours.

16. A package as claimed in claim 11 wherein the recognition means comprises one or more strips of a magnetic material.

17. A package as claimed in claim 11 wherein the recognition means comprises an inductive device.

18. A package as claimed in claim 11 wherein the recognition means comprises a plurality of electrically conductive means.

19. A method for the preparation of a beverage from a sealed package containing one or more beverage preparation ingredients located in a compartment in the package, which method comprises introducing a liquid medium suitable for the preparation of the beverage under pressure into the package through an inlet formed therein, causing the liquid medium to enter the compartment thereby forming the beverage, filtering the beverage in an upwardly direction through a filter, and collecting the beverage so formed from an outlet formed in the package.

20. A method as claimed in claim 19 wherein the inlet and/or outlet in the package is/are formed by means of a piercing and cutting tool.

21. A method as claimed in claim 19 or claim 20 wherein the liquid medium is water.

22. A method as claimed in any one of claims 19 to 21 wherein the flow of the liquid medium into the compartment containing the beverage preparation ingredients is achieved by causing the liquid to flow through one or more restricted openings into the said compartment.

23. A method as claimed in claim 22 wherein the restricted openings are elongate slots.

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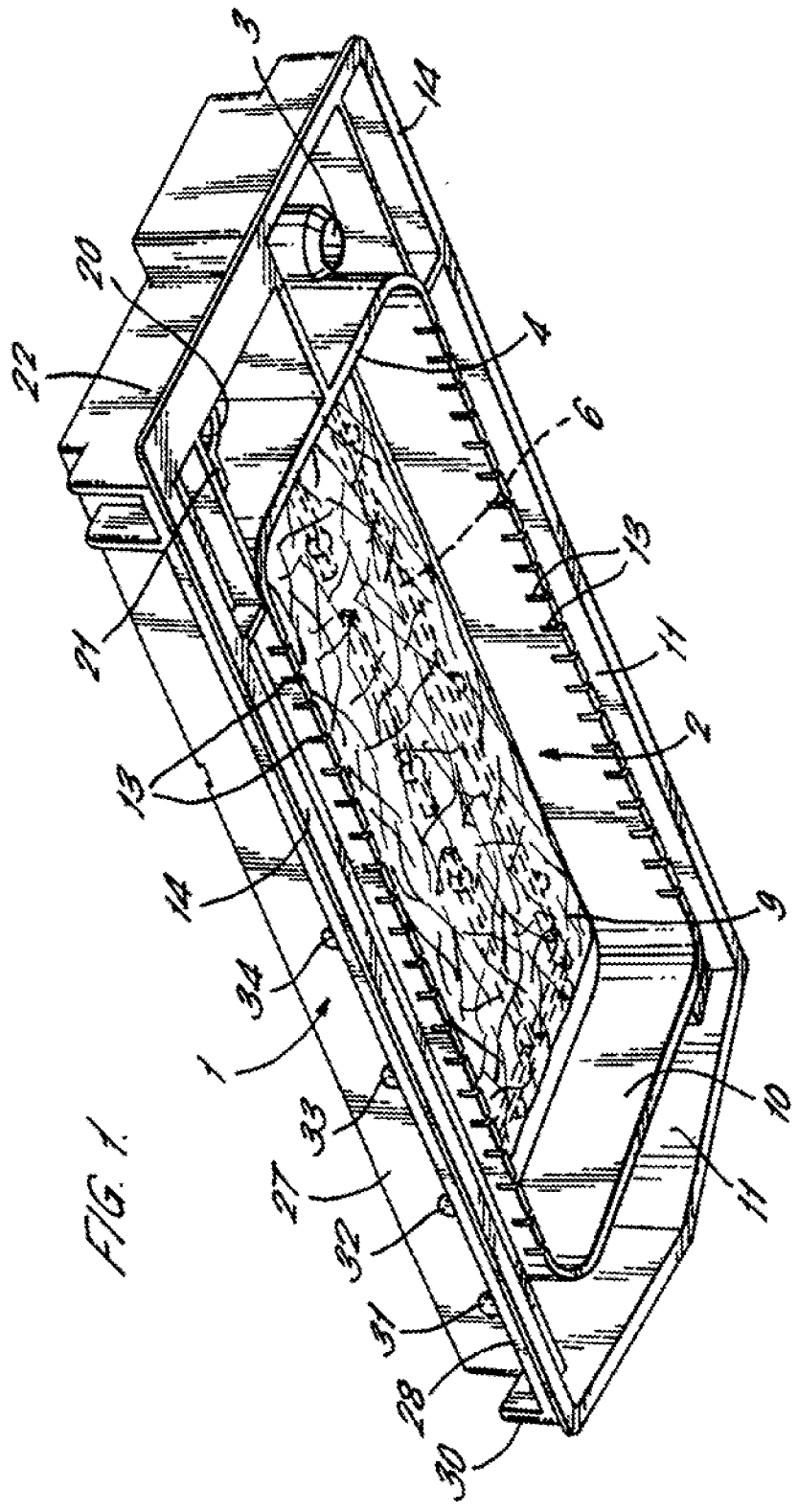


FIG. 1.

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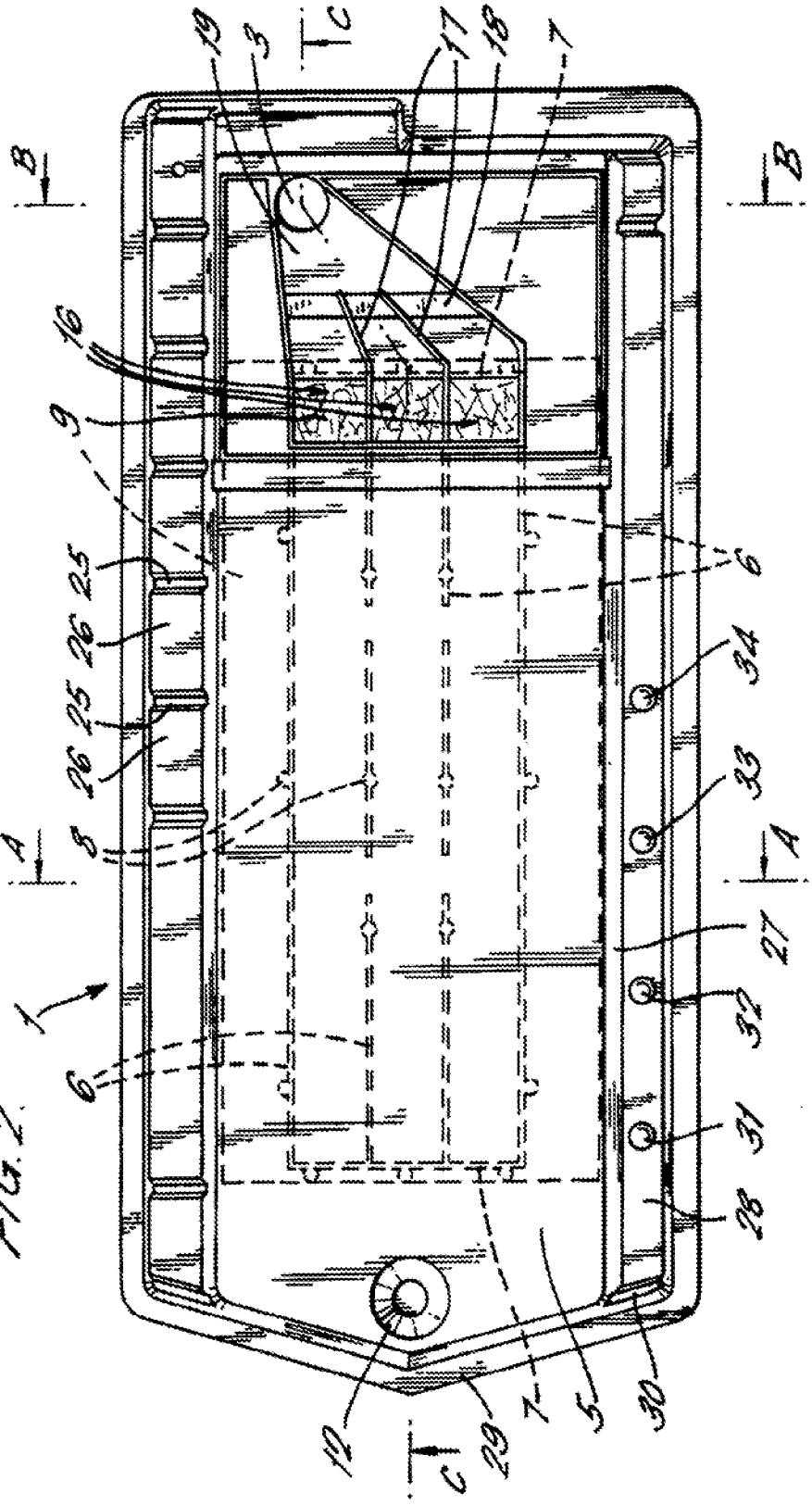


FIG. 2

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FIG. 3.

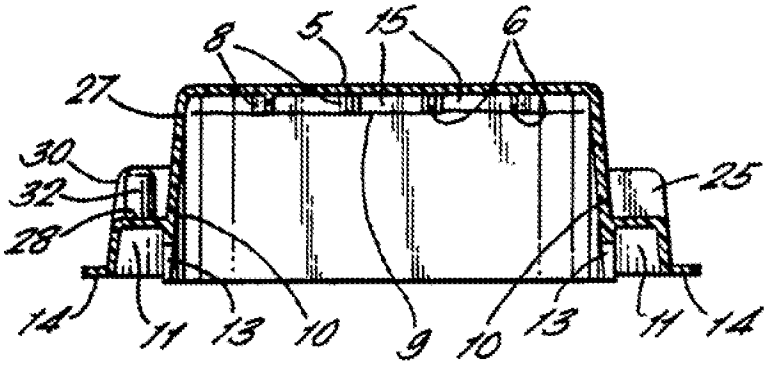
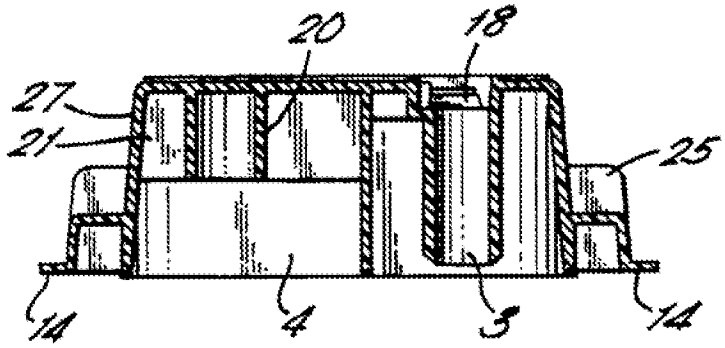


FIG. 4.



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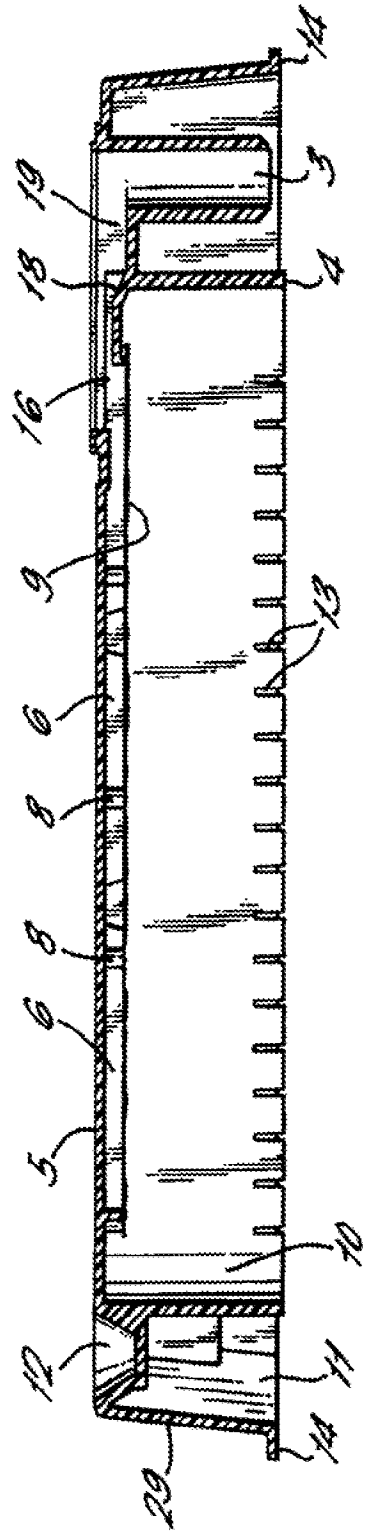


FIG. 5.

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European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 30 2538

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	EP-A-336 573 (GENERAL FOOD LIMITED) * abstract; figure 4 *	1,4,11, 19	B65B61/00
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	27 JUNE 1991	ZANGHI AMEDEO

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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(54) Film d'emballage complexé imprimé, procédé de réalisation d'un tel film, opercule mettant en oeuvre un tel film et conteneur comportant un tel opercule.

(57) L'invention concerne un film d'emballage complexé imprimé. Il comporte l'association d'un film polyester transparent (7) ; d'une première couche d'encres d'impression (9) et d'un vernis de protection (8) sur une première face du film polyester ; d'une couche de métal (10) sur la première couche d'encres et d'impression ; d'une seconde couche d'encres d'impression et d'un vernis de protection (11) sur la couche de métal à l'opposé de la première couche d'encres d'impression et de vernis, le film ayant ainsi des impressions visibles au recto et au verso.

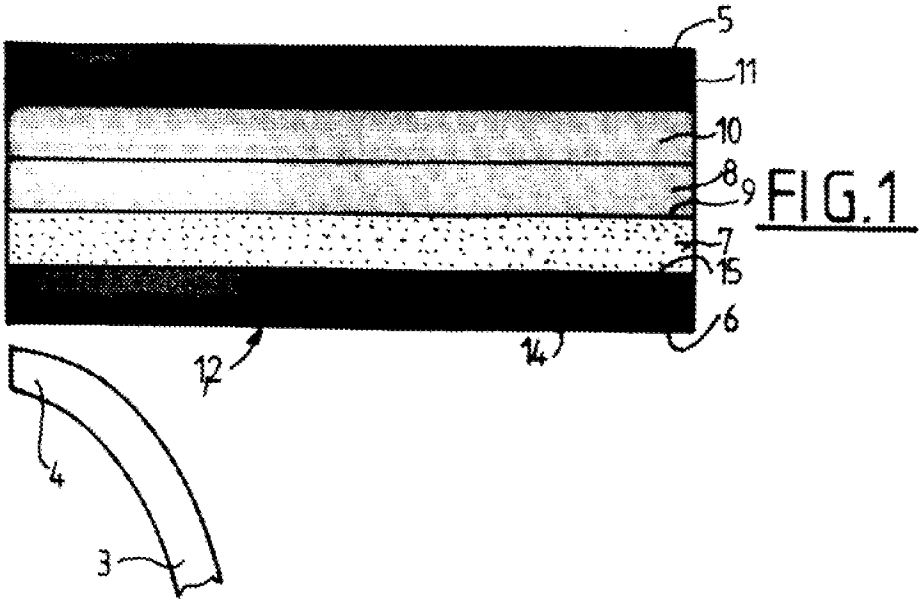


FIG.1

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L'invention concerne un film d'emballage complexé imprimé, un procédé de réalisation d'un tel film, un opercule mettant en oeuvre un tel film et un conteneur comportant un tel opercule.

On utilise couramment pour l'emballage de denrées alimentaires (tels que produits lactés, laitiers, sucrés, fromagers, charcutiers, surgelés, légumes, etc...), ou autres produits, des conteneurs comportant un récipient tel qu'un pot ou une barquette en matière plastique et un opercule de fermeture associé au récipient mais amovible (par arrachage, fracture ou autre). Un cas typique, bien que non limitatif, est celui de l'emballage de produits lactés frais (tels que des yaourts, laits fermentés ou crèmes). Dans ce cas l'opercule peut être thermoscellé au récipient et comporte le plus souvent, du côté de sa face visible extérieure (recto), des impressions décoratives, publicitaires ou informatives. Un tel opercule comprend, par exemple, un film support polyester ; sur la face de celui-ci côté verso (vers l'intérieur du conteneur) une couche de vernis thermoscellable ; et sur la face côté recto, successivement, une couche de métal, une couche de colle assurant le contre-collage avec une couche de papier lequel est revêtu d'une couche d'encre d'impression et d'un vernis de protection.

On peut se référer par exemple aux documents FR-A-2 557 542 et US-A-4 412 487.

Ainsi les opercules du type considéré précédemment ne comportent pas d'impression visible côté verso. Outre que la face côté verso est celle qui est invisible tant que le conteneur n'a pas été ouvert, la réalisation d'une impression visible côté verso -en présence d'une autre impression visible côté recto- a été jusqu'à présent écartée pour de nombreuses raisons parmi lesquelles : les recommandations des professionnels compétents. Ainsi L'ASSOCIATION FRANÇAISE DES FABRICANTS D'ENCRES D'IMPRIMERIE écrit en octobre 1989 "L'utilisation des encres au verso des emballages au contact direct des denrées alimentaires est fortement déconseillée" ; les phénomènes de migration ou contamination ayant l'encre pour origine ; la difficulté de concevoir des opercules imprimés différemment au recto et au verso.

L'invention vise donc à résoudre le problème de l'impression visible au recto et au verso de tels opercules ou, plus généralement, de films d'emballage complexés ou non.

A cet effet, l'invention propose, tout d'abord, un film d'emballage complexé ou non imprimé, caractérisé par le fait qu'il comporte l'association : d'un film polyester transparent ; d'une première couche d'encres d'impression et d'un vernis de protection sur une première face du film polyester ; d'une couche de métal sur la première couche d'encres d'impression ; d'une seconde couche d'encres d'impression et d'un vernis de protection sur la couche de métal à l'opposé de la première couche d'encres d'impression et de vernis.

Selon une première variante de réalisation, le film est constitué en outre d'une couche de vernis thermoscellable sur polystyrène, PVC, polypropylène, polyester associée à la seconde face du film polyester, la seconde couche d'encres et vernis étant en contact direct avec la couche de métal déposée par métallisation sous vide.

Selon une seconde variante de réalisation, le film est constitué en outre d'une couche de vernis thermoscellable sur polystyrène, PVC, polypropylène, polyester associée à la seconde face du film polyester, la seconde couche d'encres et vernis étant associée à la couche de métal déposée par métallisation sous vide par une couche intermédiaire en papier ou en matière plastique au moyen d'une couche de colle.

L'invention propose ensuite une première variante de procédé de réalisation de tels films comportant les étapes successives suivantes :

- on imprime le film polyester avec de l'encre puis on dépose sur l'encre le vernis protecteur par héliogravure ou flexographie ;
- on dépose la couche de métal par métallisation sous vide sur l'encre et le vernis ;
- on imprime la couche de métal avec de l'encre puis on dépose sur l'encre le vernis protecteur par héliogravure.

Et, selon une seconde variante de réalisation, le procédé comporte les étapes successives suivantes :

- on imprime le film polyester avec de l'encre puis on dépose sur l'encre le vernis protecteur par héliogravure ou flexographie ;
- on dépose la couche de métal par métallisation sous vide sur l'encre et le vernis ;
- on réalise un complexage par contre-collage avec une couche intermédiaire ;
- on imprime la couche intermédiaire avec de l'encre puis on dépose sur l'encre le vernis protecteur par héliogravure.

L'invention propose, enfin, un opercule de fermeture réalisé à partir d'un tel film et un conteneur incorporant un tel opercule.

La mise en oeuvre de l'invention permet de réaliser des films d'emballage imprimés sur les deux faces recto et verso, les impressions étant visibles côté recto et côté verso. De tels films d'emballage peuvent être mis en oeuvre pour l'obtention d'opercules incorporés à des conteneurs sur des récipients tels que pots ou barquettes auxquels ils sont associés rigidement notamment par thermoscellage. Le film tel qu'il est considéré ici est le produit fini et celui-ci est lui-même plus ou moins complexé.

L'impression sur les faces recto et verso (c'est-à-dire visible depuis le recto et le verso) permet de doubler la surface d'impression ce qui est particulièrement utile lorsque l'on sait la quantité d'informations à communiquer. De plus, l'impression

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sur la face verso qui est normalement cachée, tant que l'opercule n'est pas ouvert, présente de nombreux avantages : elle présente un agrément pour l'utilisateur par rapport à des opercules dont la face verso n'est pas imprimée. Elle permet de ne faire découvrir un message qu'au moment même de l'ouverture du conteneur. A ce titre, cette technique peut être mise en oeuvre à l'occasion de jeux, concours, etc...

Les autres caractéristiques et avantages de l'invention résulteront de la description qui suivra en référence aux dessins annexés dans lesquels :

- Les figures 1 à 3 sont trois vues schématiques, en coupe axiale, illustrant trois variantes indicatives et non limitatives de films d'emballage complexés imprimés selon l'invention.
- La figure 4 est une vue schématique, en coupe, d'un conteneur incorporant un opercule réalisé à partir d'un tel film.

L'invention concerne un film d'emballage complexé ou non imprimé 1 tout spécialement destiné à la réalisation d'un opercule de fermeture 2 pour un récipient 3 tel qu'un pot ou barquette en matière plastique pourvu d'une collerette 4 à laquelle l'opercule 2 est associé rigidement mais d'une manière autorisant l'ouverture, notamment par arrachage. A cet effet, l'opercule 2 peut être thermoscellé à la collerette 4.

L'opercule 2 comporte des impressions visibles du côté de ses faces extérieure ou recto 5 et intérieure ou verso 6 étant donné que le film d'emballage 1 à partir duquel il est réalisé est lui-même imprimé pour être visible au recto et au verso.

Le film d'emballage imprimé 1 comporte plusieurs couches de matériaux associées entre elles pour former un tout structurel monobloc.

A cet effet, le film d'emballage complexé imprimé 1 comporte l'association d'un film polyester transparent 7 ; d'une première couche d'encres d'impression et d'un vernis de protection 8 sur une première face 9 du film polyester 7 ; d'une couche de métal 10 sur la première couche d'encres et d'impression 8 ; d'une seconde couche d'encres d'impression et d'un vernis de protection 11 sur la couche de métal 10 à l'opposé de la première couche d'encres d'impression et de vernis 8.

Il doit être ici entendu que la notion de "couche" est celle couramment utilisée par l'homme du métier dans le domaine des films d'emballage complexes. Une couche au sens de la présente description est elle-même unique ou multiple, homogène ou complexe.

La préposition "sur" utilisée pour qualifier qu'une couche est "sur" une autre permet de repérer la position relative de ces deux couches. Par contre, la préposition "sur" ne signifie pas nécessairement que les deux couches sont en contact l'une sur l'autre ou associées directement l'une à l'autre.

Dans les trois variantes de réalisation représentées sur les figures, la première couche d'encres et vernis 8 est en contact sur le film polyester 7 et la couche de métal 10 est en contact sur le première couche d'encres et vernis 8.

Dans la première variante (figure 1), la seconde couche d'encres et vernis 11 est en contact direct sur la couche de métal 10 tandis que dans la seconde et dans la troisième variantes (figures 2 et 3), la seconde couche d'encres et vernis 11 est séparée de la couche de métal 10 par au moins une couche intermédiaire 12. Dans le cas de la deuxième variante (figure 2) la couche intermédiaire 12 est une feuille de papier tel qu'un papier kraft blanchi couché une face à 40g/m² tandis que dans le cas de la troisième variante (figure 3) une couche intermédiaire est un film en matière plastique notamment à polyester de 23µm (microns) ou encore un polypropylène coextrudé de 30µm.

Une telle couche intermédiaire 12 est associée à la couche de métal 10 par collage, contre-collage, au moyen d'une couche de colle 13.

Dans les trois variantes représentées sur les fibres, une couche de vernis 14 est associée au film polyester 7 au contact de sa seconde face 15. Cette couche de vernis 14 constitue la face intérieure ou verso 6 du film. Dans le cas d'un opercule 2 devant être associé à un récipient 3 par thermoscellage, le vernis de la couche de vernis 14 est de type thermoscellable sur la matière plastique correspondante du récipient 3 notamment le polystyrène, le PVC, le polypropylène, le polyester.

La première couche d'encres et de vernis 8 est déposée sur le film polyester 7 par héliogravure ou flexographie. La seconde couche d'encres et de vernis 11 est déposée au contact de la couche de métal 10 ou de la couche intermédiaire 12 par héliogravure.

La couche de métal 10 est déposée par métallisation sous vide.

Le vernis de la première ou de la seconde couche d'encres et de vernis 8, 11 est préférentiellement un vernis nitro-cellulosique. La colle de la couche de colle 13 est préférentiellement de type polyuréthanne à deux composants.

On se réfère maintenant plus spécifiquement à la figure 1 qui illustre une première variante de réalisation.

Dans cette variante, le film polyester transparent 7 a une épaisseur de l'ordre de 10 à 30µm. Des exemples typiques de réalisation mettent en oeuvre des films de 12 et 2 3 µm.

Le vernis nitro-cellulosique de la première couche d'encres d'impression et de vernis 8 est déposé en à plat total sur les encres préalablement déposées, avec une densité de l'ordre du g/m². Ce vernis constitue un surlaquage protecteur qui permet de protéger les encres lors de l'opération de métallisation sous vide ultérieure. Il en résulte que la qualité des teintes est conservée pendant cette opération de métallisa-

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tion.

La couche de métal 10 déposée est de l'ordre de 250Å (Angtröms). Cette couche donne d'une part un aspect métallisé et, d'autre part, constitue un écran totalement opaque permettant d'avoir sur les deux faces extérieure et intérieure 5, 6 des impressions différentes. Le vernis nitro-cellulosique de la seconde couche d'encres et vernis 8 est déposée à raison de quelques grammes/m² (par exemple de l'ordre de 3g/m²). Le vernis de la couche de vernis 11 peut être composé de résines vinyliques et acryliques et il est déposé à raison de 2 à 5g/m².

On se réfère maintenant à la figure 2 qui illustre la deuxième variante.

A partir de la structure comprenant le film polyester 7, la première couche d'encres et vernis 8 et la couche de métal 10, on assure le contre-collage au moyen de la couche de colle 13 d'une feuille de papier kraft 12. la seconde couche d'encres et de vernis 11 est déposée sur la feuille de papier 12 à raison de quelques grammes/m² (par exemple 3g/m²). Ensuite, la couche de vernis 14 est déposée à raison de quelques grammes/m² (par exemple de l'ordre de 2 à 5g/m²).

La structure de la troisième variante (figure 3) est semblable et dérivée de celle de la seconde variante, la feuille de papier étant remplacée par un film plastique polyester pouvant avoir une épaisseur de l'ordre d'une vingtaine de microns. Ou, en sous-variante, la feuille de papier peut être remplacée par un film polypropylène coextrudé d'une épaisseur de l'ordre de 30µm.

L'invention concerne également les procédés de réalisation de tels films d'emballage.

Dans le cas du film de la première variante (figure 1), le procédé comporte les étapes successives consistant à imprimer le film polyester 7 avec d'abord de l'encre puis, sur l'encre, avec le vernis protecteur et cela par héliogravure ou flexographie ; puis à déposer sur la première couche d'encres et de vernis 8 ainsi réalisée la couche de métal 10 par métallisation sous vide ; puis à imprimer la couche de métal 10 avec de l'encre puis à déposer sur l'encre le vernis protecteur par héliogravure afin de réaliser la seconde couche d'encres et de vernis 11.

Le surlaquage protecteur par le vernis nitro-cellulosique en ce qui concerne la couche 8 est réalisé en ligne avec l'impression hélio ou flexo des encres de cette même couche 8. La métallisation sous vide permettant de réaliser la couche de métal 10 est réalisée directement sur la face préalablement imprimée. Elle est donc en contact avec la première couche d'encres et de vernis 8. L'impression d'encres et le dépôt de vernis permettant de constituer la seconde couche d'encres et de vernis 11 sont réalisés ultérieurement par héliogravure sur la face métallisée libre de la couche de métal 10, généralement simultanément.

Le procédé comporte également une étape ultérieure de dépôt sur le film polyester 7 (sa seconde face 15) de la couche 14 de vernis, par héliogravure également.

Un tel film est destiné à être stocké, transporté, livré et utilisé sous forme de bobine et, pour cette raison, le procédé comporte également une étape de rebobinage du film préalablement réalisé.

Les films selon la deuxième et la troisième variante (figures 2 et 3) sont réalisés par le même procédé mettant en oeuvre soit une feuille de papier, soit un film plastique. Ce procédé est dérivé du procédé permettant la réalisation du film selon la première variante, déjà décrit. On part en effet de la structure comportant le film polyester 7, la première couche d'encres et de vernis 8 et la couche de métal 10. Puis, on effectue le contre-collage de la couche intermédiaire 12 (feuille de papier ou film plastique). Ce collage met en oeuvre de la colle polyuréthanne à deux composants et une machine de complexage.

C'est le complexe ainsi réalisé qui est imprimé par héliogravure sur la face libre de la couche intermédiaire 12 et, en ligne avec cette impression est déposée la couche de vernis 14. Comme précédemment, le film peut être ultérieurement rebobiné.

Le procédé selon l'invention met en oeuvre quatre techniques : l'héliogravure, la flexographie, la métallisation sous vide et le complexage.

Dans la technique d'héliogravure, un cylindre gravé est recouvert d'encre. Puis, le cylindre est entraîné en rotation et l'encre en excès est éliminée par une racle en appui sur le cylindre. L'encre contenue dans les alvéoles du cylindre est reportée, par pression, sur le support à imprimer. Après l'impression de chaque couleur, le support est séché par chauffage et pulsation d'air et peut alors recevoir une nouvelle couleur au poste ultérieur de la machine hélio. Sept couleurs peuvent ainsi être imprimées en ligne sur la même machine.

Dans la technique de flexographie, il y a impression par contact à l'aide d'une forme d'impression flexible. Une machine classique pour la mise en oeuvre de cette technique comporte un cylindre barboteur, un cylindre toucheur et un cylindre porte-cliché, par couleur. La machine comporte également une râcle et un cylindre de contre-pression commun à toutes les couleurs dans le cas d'une machine à tambour central. Une telle machine permet l'impression de quatre couleurs sur les machines à tambour central classiques ou six couleurs dans le cas de machines aménagées. Le cylindre toucheur permet d'apporter l'encre au cliché flexographique sous la forme d'un film mince, d'épaisseur parfaitement uniforme. La forme des alvéoles, la linéature et l'orientation de la linéature sont choisies par l'imprimeur selon la trame du sujet à imprimer. Les clichés sont généralement en caoutchouc ou photopolymères. Dans le premier cas, l'impression n'est pas tramée et destinée à des cartons ondulés tandis que dans le deuxième cas, les

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impressions sont fines et tramées et destinées à des films. Dans une machine à tambour central, le séchage est réalisé en plusieurs étapes : un séchage entre chaque couleur pour permettre de déposer la couleur suivante et un séchage final "à coeur".

La technique de métallisation sous vide consiste à évaporer un métal qui, dans le cas considéré par l'invention est de l'aluminium, sur un support défilant en permanence au-dessus de la zone d'évaporation. Cette évaporation a lieu sous vide. Les sources d'évaporation sont alimentées en permanence par le matériau devant être déposé. Le métal se condense sur le matériau support pour former une couche de métal uniforme. L'énergie calorifique absorbée par le support est dissipée par contact avec un cylindre refroidisseur.

La technique de complexage est connue pour être d'usage courant pour la réalisation de films complexés. le complexage met en oeuvre une machine de complexage qui à l'une de ses extrémités reçoit une bobine de matière première. Cette matière première reçoit une enduction de colle solvant. Par ventilation d'air chaud, les solvants sont séchés. Puis, le support à complexer est appliqué par forte pression sur le support initial. En seconde partie extrême de la machine, le matériau ainsi contre-collé est embobiné.

Revendications

1. Film d'emballage complexé imprimé, caractérisé par le fait qu'il comporte l'association :
   - d'un film polyester transparent (7) ;
   - d'une première couche d'encres d'impression et d'un vernis de protection (8) sur une première face (9) du film polyester (7) ;
   - d'une couche de métal (10) sur la première couche d'encres et d'impression (8) ;
   - d'une seconde couche d'encres d'impression et d'un vernis de protection (11) sur la couche de métal (10) à l'opposé de la première couche d'encres d'impression et de vernis (8),

   le film ayant ainsi des impressions visibles au recto et verso.

2. Film selon la revendication 1, caractérisé par le fait que la première couche d'encres et vernis (8) est en contact sur le film polyester (7).

3. Film selon l'une quelconque des revendications 1, 2, caractérisé par le fait que la couche de métal (10) est en contact sur la première couche d'encres et vernis (8).

4. Film selon l'une quelconque des revendications 1 à 3, caractérisé par le fait que la seconde couche d'encres et vernis (11) est en contact direct sur la couche de métal (10).

5. Film selon l'une quelconque des revendications 1 à 3, caractérisé par le fait que la seconde couche d'encres et vernis (11) est séparée de la couche de métal (10) par au moins une couche intermédiaire (12).

6. Film selon la revendication 5, caractérisé par le fait qu'une couche intermédiaire (12) est une feuille de papier.

7. Film selon la revendication 6, caractérisé par le fait qu'une couche intermédiaire (12) est un film en matière plastique.

8. Film selon l'une quelconque des revendications 5 à 7, caractérisé par le fait qu'une couche intermédiaire (12) est associée à la couche de métal (10) par collage, contre-collage, au moyen d'une couche de colle (13).

9. Film selon l'une quelconque des revendications 1 à 8, caractérisé par le fait qu'une couche de vernis (14) est associée au film polyester (7) au contact de sa seconde face (15).

10. Film selon l'une quelconque des revendications 1 à 9, caractérisé par le fait que la première couche d'encres et vernis (8) est déposée sur le film polyester (7) par héliogravure ou flexographie.

11. Film selon l'une quelconque des revendications 1 à 10, caractérisé par le fait que le vernis de la première et seconde couche d'encres et vernis est un vernis nitro-cellulosique.

12. Film selon l'une quelconque des revendications 1 à 11, caractérisé par le fait que la couche de métal (10) est déposée par métallisation sous vide.

13. Film selon la revendication 8, caractérisé par le fait que la colle de la couche de colle (13) est de type polyuréthanne à deux composants.

14. Film selon l'une quelconque des revendications 1, 4, 5, caractérisé par le fait que la seconde couche d'encres et vernis (11) est déposée sur la couche de métal (10) ou une couche intermédiaire (12) par héliogravure.

15. Film selon la revendication 9, caractérisé par le fait que le vernis de la couche de vernis (14) associée au film polyester (7) est de type thermoscellable sur polystyrène, PVC, polypropylène, polyester.

16. Film selon la revendication 1, caractérisé par le

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fait qu'il est constitué en outre d'une couche de vernis thermoscellable sur polystyrène, PVC, polypropylène, polyester associée à la seconde face du film polyester, la seconde couche d'encres et vernis étant en contact direct avec la couche de métal déposée par métallisation sous vide.

17. Film selon la revendication 1, caractérisé par le fait qu'il est constitué en outre d'une couche de vernis thermoscellable sur polystyrène, PVC, polypropylène, polyester associée à la seconde face du film polyester, la seconde couche d'encres et vernis étant associée à la couche de métal déposée par métallisation sous vide par une couche intermédiaire en papier ou en matière plastique au moyen d'une couche de colle.

18. Procédé de réalisation d'un film d'emballage complexé imprimé selon la revendication 1, caractérisé par les étapes successives suivantes :

- on imprime le film polyester (7) avec de l'encre puis on dépose sur l'encre le vernis protecteur par héliogravure ou flexographie ;
- on dépose la couche de métal (10) par métallisation sous vide sur l'encre et le vernis ;
- on imprime la couche de métal (10) avec de l'encre puis on dépose sur l'encre le vernis protecteur par héliogravure.

19. Procédé de réalisation d'un film d'emballage complexé imprimé selon la revendication 1, caractérisé par les étapes successives suivantes :

- on imprime le film polyester (7) avec de l'encre puis on dépose sur l'encre le vernis protecteur par héliogravure ou flexographie ;
- on dépose la couche de métal (10) par métallisation sous vide sur l'encre et le vernis ;
- on réalise un complexage par contre-collage avec une couche intermédiaire (12) ;
- on imprime la couche intermédiaire (12) avec de l'encre puis on dépose sur l'encre le vernis protecteur par héliogravure.

20. Procédé selon l'une quelconque des revendications 19, 20, caractérisé par le fait qu'il comporte également une étape ultérieure de dépôt sur le film polyester (7) d'une couche de vernis (14) par héliogravure.

21. Procédé selon l'une quelconque des revendications 18 à 20, caractérisé par le fait qu'il comporte également une étape terminale de rebobinage du film (1) ainsi réalisé.

22. Opercule de fermeture de récipient, caractérisé par le fait qu'il est obtenu à partir d'un film d'emballage complexé (1) selon l'une quelconque des revendications 1 à 17.

23. Conteneur comportant un récipient (3) tel qu'un pot ou une barquette en matière plastique et un opercule de fermeture (2) associé au récipient (3) selon la revendication 22.

24. Conteneur selon la revendication 23, caractérisé par le fait que l'opercule (2) est thermoscellé au récipient (3).

25. Conteneur selon l'une quelconque des revendications 23 et 24, caractérisé par le fait que l'opercule (2) comporte des impressions visibles à l'extérieur et à l'intérieur.

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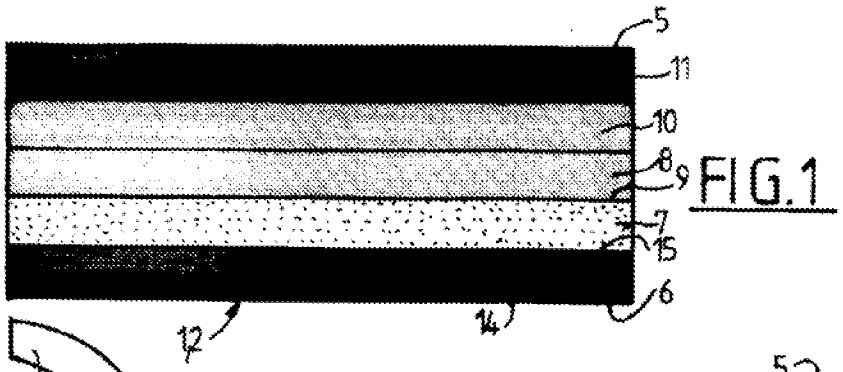


FIG.1

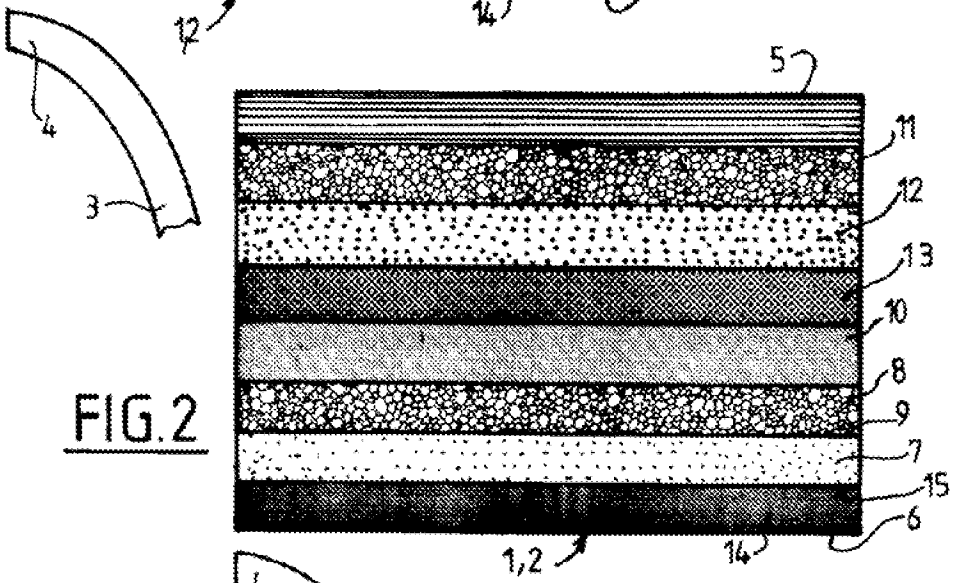


FIG.2

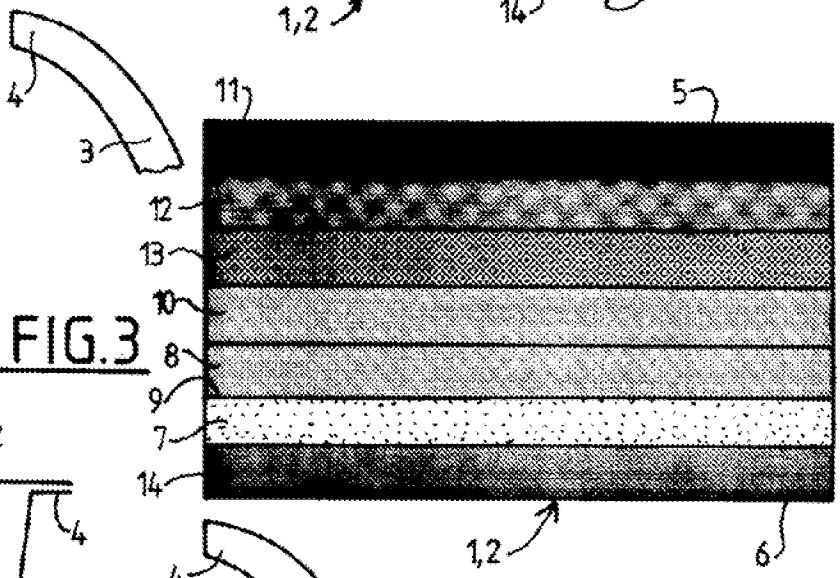


FIG.3

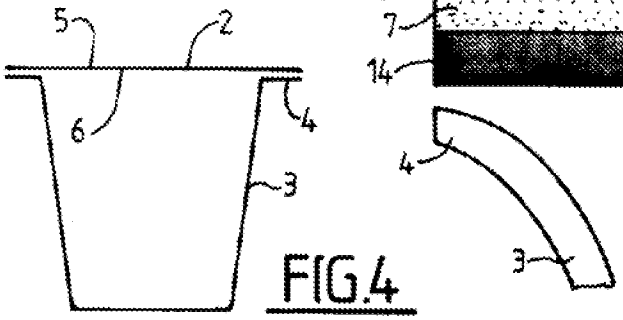


FIG.4

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Office européen des brevets

RAPPORT DE RECHERCHE EUROPEENNE

Numero de la demande

EP 91 40 2014

DOCUMENTS CONSIDERES COMME PERTINENTS

Catégorie	Citation du document avec indication, en cas de besoin, des parties pertinentes	Revendication concernée	CLASSEMENT DE LA DEMANDE (Int. Cl.5)
Y	EP-A-0 223 253 (TOYO ALUMINIUM K.K.) * Page 2, ligne 11 - page 6, ligne 23; revendications 1,2; figures 1,2,7 *	1	B 32 B 15/08 B 32 B 27/36 B 65 D 65/40
A		4,5,9, 12,15, 17,22, 23	
Y	US-A-4 092 449 (BERNSTEIN) * Colonne 5, ligne 10 - colonne 5, ligne 13; revendication 1; figure 4 *	1	
A		10,19	
A	EP-A-0 125 107 (AMERICAN CAN CO.) * Page 8, ligne 10 - page 9, ligne 18; revendications 1,5,8,16 *	1,3,12, 16-17, 22	
A	EP-A-0 358 445 (TONEN SEKIYUKAGAKU K.K.) * Revendications 1,3,4; figure 1b; exemple 2, exemple compartif 1 *	1,12,15 ,17	DOMAINES TECHNIQUES RECHERCHES (Int. Cl.5)
A	FR-A-2 620 094 (THE STANDARD PRODUCTS CO.) * Revendications 1,3,11,12; figure 2; revendications 14,16 *	1,3-5,7 ,12,19	B 32 B

Le présent rapport a été établi pour toutes les revendications

Lieu de la recherche	Date d'achèvement de la recherche	Examinateur
LA HAYE	07-11-1991	DERZ T.

CATEGORIE DES DOCUMENTS CITES

X : particulièrement pertinent à lui seul
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A : arrière-plan technologique
O : divulgation non-écrite
P : document intercalaire

T : théorie ou principe à la base de l'invention
E : document de brevet antérieur, mais publié à la date de dépôt ou après cette date
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Espacenet

Bibliographic data: EP0468864 (A1) — 1992-01-29

Complex printed packaging film, method of making such a film, cover using such a film and container with such a cover.

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Classification: - **international:** ***B32B27/36; B65D77/20;*** *B41M3/00;* (IPC1-7): B32B15/08; B32B27/36; B65D65/40
- **cooperative:** **B32B27/36 (EP, US); B32B7/12 (US);** B32B2038/0092 (US); B32B2255/10 (US); B32B2255/12 (US); B32B2255/205 (US); B32B2307/31 (US); B32B2317/12 (US); B32B2367/00 (US); B32B2439/70 (US); B41M3/00 (EP)

Application number: EP19910402014 19910718 Global Dossier

Priority number(s): FR19900009500 19900725

Also published as: EP0468864 (B1) EP0468864 (B2) AT128072 (T) DE69113160 (T2) DE69113160 (T3) more

Abstract of EP0468864 (A1)

The invention relates to a complex printed packaging film. It comprises the combination of a transparent polyester film (7): a first layer of printing inks (9) and a protective varnish (8) over a first face of the polyester film; a metal layer (10) over the first layer of printing inks; a second layer of printing inks and of a protective varnish (11) over the metal layer on the opposite side from the first layer of printing inks and of varnish, the film thus having visible printing on both sides.

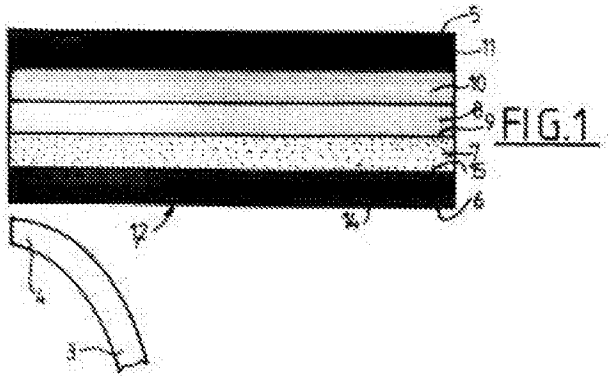


FIG.1

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DESCRIPTION EP0468864

The invention relates to a printed complexed packaging film, a method for producing such a film, a cap employing such a film and a container comprising such a cap.

It is commonly used for the packaging of foodstuffs (such as dairy products, dairy products, sugar, cheese, meat products, frozen foods, vegetables, etc ...), or other products, containers comprising a container such as a pot or a container, plastic tray and a closure seal associated with the container but removable (by tearing, fracture or other). A typical case, although not limiting, is that of the packaging of fresh dairy products (such as yogurts, fermented milks or creams). In this case the lid can be heat sealed to the container and most often, on the side of its external visible face (front), decorative impressions, advertising or informative. Such a cover includes, for example, a polyester support film; on the face of the latter side back (towards the inside of the container) a layer of heat-sealable varnish; and on the front side side, successively, a metal layer, a layer of adhesive ensuring the against-sticking with a layer of paper which is coated with a layer of printing ink and a protective varnish.

For example, documents FR-A-2 557 542 and US-A-4 412 487 may be referred to.

Thus the covers of the type considered previously do not have visible printing on the back side. In addition to the back side being the one that is invisible until the container has been opened, the realization of a visible print on the back side - in the presence of another print visible side recto - has so far been ruled out for many reasons including, the recommendations of competent professionals. Thus the FRENCH ASSOCIATION OF PRINTER INK MANUFACTURERS writes in October 1989 "The use of inks on the back of packaging in direct contact with foodstuffs is strongly discouraged"; migration phenomena or contamination having the ink for origin; the difficulty of designing operculas printed differently on the front and back.

The invention therefore aims to solve the problem of visible printing on the front and back of such lids or, more generally, complex or non-complexed packaging films.

For this purpose, the invention proposes, first of all, a complexed or unprinted packaging film, characterized in that it comprises the combination of: a transparent polyester film; a first layer of printing inks and a protective coating on a first side of the polyester film; a metal layer on the first layer of printing inks; a second layer of printing inks and a protective varnish on the metal layer opposite the first layer of printing and varnish inks.

According to a first variant embodiment, the film is furthermore composed of a layer of heat-sealable varnish on polystyrene, PVC, polypropylene, polyester associated with the second side of the polyester film, the second layer of inks and varnish being in direct contact with the metal layer deposited by vacuum metallization.

According to a second variant embodiment, the film is furthermore composed of a layer of heat-sealable varnish on polystyrene, PVC, polypropylene, polyester associated with the second side of the polyester film, the second layer of inks and varnish being associated with the layer of metal deposited by vacuum metallization by an intermediate layer of paper or plastic by means of a layer of glue.

The invention then proposes a first variant of a process for producing such films, comprising the following successive steps: the polyester film is printed with ink and then the protective lacquer is deposited on the ink by gravure printing or flexography; depositing the metal layer by vacuum metallization on the ink and varnish; the metal layer is printed with ink and then the protective lacquer is deposited on the ink by gravure printing.

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And, according to a second variant embodiment, the method comprises the following successive steps: the polyester film is printed with ink and then the protective lacquer is deposited on the ink by gravure printing or flexography; depositing the metal layer by vacuum metallization on the ink and varnish; laminating is carried out by laminating with an intermediate layer; the intermediate layer is printed with ink and then the protective lacquer is deposited on the ink by gravure printing.

The invention finally proposes a closure cap made from such a film and a container incorporating such a cap.

The implementation of the invention makes it possible to produce packaging films printed on both front and back sides, the prints being visible on the front side and the back side. Such packaging films may be used to obtain lids incorporated in containers on containers such as pots or trays to which they are rigidly associated, in particular by heat sealing. The film as it is considered here is the finished product and it is itself more or less complexed.

Printing on the front and back sides (ie visible from the front and back) doubles the print area which is especially useful when you know how much information you need to communicate . In addition, the printing on the reverse side which is normally hidden, as long as the lid is not open, has many advantages: it presents an agreement for the user with respect to operculas whose back side is not printed. It makes it possible to discover a message only at the very moment of opening the container. As such, this technique can be implemented during games, competitions, etc ...

The other characteristics and advantages of the invention will result from the description which will follow with reference to the appended drawings in which: FIGS. 1 to 3 are three schematic views, in axial section, illustrating three indicative and nonlimiting variants of complexed packaging films printed matter according to the invention. Figure 4 is a schematic sectional view of a container incorporating a cap made from such a film.

The invention relates to a complexed or unprinted packaging film 1 specially designed for the production of a closing cap 2 for a receptacle 3 such as a plastic pot or container provided with a flange 4 to which operculum 2 is rigidly associated but in a manner allowing opening, in particular by tearing. For this purpose, the lid 2 may be heat sealed to the flange 4.

The cover 2 has visible impressions on the side of its outer or front faces 5 and inner or back 6 since the packaging film 1 from which it is made is itself printed to be visible on the front and back .

The printed packaging film 1 comprises several layers of materials associated with each other to form a monobloc structural whole.

For this purpose, the complexed printed packaging film 1 comprises the combination of a transparent polyester film 7; a first layer of printing inks and a protective varnish 8 on a first face 9 of the polyester film 7, a metal layer 10 on the first ink and printing layer 8, a second layer of printing inks and a protective varnish 11 on the metal layer 10 opposite the first layer of printing and varnishing inks 8.

It should be understood here that the concept of "layer" is that commonly used by those skilled in the field of complex packaging films. A layer within the meaning of the present description is itself single or multiple, homogeneous or complex.

The preposition "on" used to qualify one layer is "on" another to identify the relative position of these two layers. On the other hand, the "on" preposition does not necessarily mean that the two layers are in contact with one another or directly associated with one another.

In the three embodiments shown in the figures, the first layer of inks and varnish 8 is in contact on the polyester film 7 and the metal layer 10 is in contact on the first layer of inks and varnish 8.

In the first variant (FIG. 1), the second layer of inks and varnishes 11 is in direct contact on the metal layer 10 while in the second and third variants (FIGS. 2 and 3), the second layer of inks and varnishes 11 is separated from the metal layer 10 by at least one intermediate layer 12. In the case of the second variant (FIG. 2), the intermediate layer 12 is a sheet of paper such as a bleached kraft paper coated one side at 40 g / m² while in the case of the third variant (FIG. is a plastic film including 23 micron polyester (microns) or a coextruded polypropylene of 30 .mu.m.

Such an intermediate layer 12 is associated with the metal layer 10 by gluing, laminating, by means of an adhesive layer 13.

In the three variants represented on the fibers, a layer of varnish 14 is associated with the polyester film 7 in contact with its second face 15. This layer of varnish 14 constitutes the inside or back face 6 of the film. In the case of a lid 2 to be associated with a container 3 by heat sealing, the varnish of the layer of varnish 14 is heat sealable type on the corresponding plastic material of the container 3 including polystyrene, PVC, polypropylene, polyester .

The first layer of inks and varnish 8 is deposited on the polyester film 7 by gravure printing or flexography. The second layer of inks and varnishes 11 is deposited in contact with the metal layer 10 or the intermediate layer 12 by gravure printing.

The metal layer 10 is deposited by vacuum metallization.

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The varnish of the first or second layer of inks and varnishes 8, 11 is preferably a nitro-cellulosic varnish. The glue of the adhesive layer 13 is preferably of the two-component polyurethane type.

Referring now more specifically to Figure 1 which illustrates a first embodiment.

In this variant, the transparent polyester film 7 has a thickness of the order of 10 to 30 µm. Typical embodiments implement films of 12 and 23 microns.

The nitro-cellulosic varnish of the first layer of printing and varnish inks 8 is deposited in total flat on previously deposited inks, with a density of about g / m². This varnish constitutes a protective overlaid which makes it possible to protect the inks during the subsequent metallization operation under vacuum. As a result, the quality of the colors is preserved during this metallization operation.

The deposited metal layer is of the order of 250Å (Angtröms). This layer gives on the one hand a metallized appearance and, on the other hand, constitutes a totally opaque screen making it possible to have different impressions on the two outer and inner faces 5, 6. The nitrocellulose varnish of the second layer of inks and varnishes It is deposited at a rate of a few grams / m² (for example of the order of 3 g / m²). The varnish of the varnish layer 11 can be composed of vinyl and acrylic resins and is deposited at a rate of 2 to 5 g / m².

Referring now to Figure 2 which illustrates the second variant.

From the structure comprising the polyester film 7, the first layer of inks and varnish 8 and the metal layer 10, laminating is carried out by means of the adhesive layer 13 of a sheet of kraft paper 12, the second layer of inks and varnish 11 is deposited on the sheet of paper 12 at a rate of a few grams / m² (for example 3g / m²). Then, the varnish layer 14 is deposited at a rate of a few grams / m² (for example of the order of 2 to 5g / m²).

The structure of the third variant (FIG. 3) is similar and derived from that of the second variant, the paper sheet being replaced by a polyester plastic film having a thickness of the order of about twenty microns. Or, as a sub-variant, the paper sheet may be replaced by a coextruded polypropylene film with a thickness of the order of 30 .mu.m.

The invention also relates to methods for producing such packaging films.

In the case of the film of the first variant (FIG. 1), the process comprises the successive steps of printing the polyester film 7 with ink first and then, on the ink, with the protective lacquer, and this by gravure printing, or flexography; then to deposit on the first layer of inks and varnish 8 thus produced the metal layer 10 by vacuum metallization; then to print the metal layer 10 with ink and then to deposit on the ink the protective varnish by gravure to achieve the second layer of inks and varnish 11.

The protective overlaid by the nitro-cellulosic varnish with regard to the layer 8 is carried out in line with the gravure or flexo printing of the inks of this same layer 8. The vacuum metallization for producing the metal layer 10 is performed directly on the previously printed face. It is in contact with the first layer of inks and varnish 8. The printing of inks and the deposition of varnish for forming the second layer of inks and varnish 11 are subsequently performed by gravure on the free metallized face of the metal layer 10, generally simultaneously.

The method also comprises a subsequent deposition step on the polyester film 7 (its second face 15) of the layer 14 of varnish, also by gravure.

Such a film is intended to be stored, transported, delivered and used in the form of a reel and, for this reason, the method also comprises a rewinding step of the previously made film.

The films according to the second and the third variant (FIGS. 2 and 3) are produced by the same method using either a sheet of paper or a plastic film. This process is derived from the process for producing the film according to the first variant, already described. We start from the structure comprising the polyester film 7, the first layer of inks and varnish 8 and the metal layer 10. Then, laminating of the intermediate layer 12 (paper sheet or plastic film) is carried out. This bonding uses two-component polyurethane glue and a laminating machine.

It is the complex thus produced which is printed by gravure on the free face of the intermediate layer 12 and, in line with this impression, is deposited the varnish layer 14. As before, the film can be rewound later.

The process according to the invention uses four techniques: gravure printing, flexography, vacuum metallization and complexing.

In gravure printing, an engraved cylinder is covered with ink. Then, the cylinder is rotated and the excess ink is removed by a squeegee bearing on the cylinder. The ink contained in the cells of the cylinder is transferred, by pressure, onto the medium to be printed. After printing each color, the media is dried by heating and pulsating air and can then receive a new color at the subsequent station of the gravure machine. Seven colors can be printed online at this press speed.

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In the flexographic technique, there is contact printing using a flexible printing form. A conventional machine for the implementation of this technique comprises a bubbler cylinder, a platen roller and a platen roller, by color. The machine also has a rattle and a counterpressure cylinder common to all colors in the case of a central drum machine. Such a machine makes it possible to print four colors on conventional central drum machines or six colors in the case of fitted machines. The touching cylinder makes it possible to add the ink to the flexographic plate in the form of a thin film of perfectly uniform thickness. The shape of the cells, the linearization and the orientation of the screen are chosen by the printer according to the frame of the subject to be printed. The pictures are usually made of rubber or photopolymers. In the first case, the printing is not raster and intended for corrugated cardboard boxes while in the second case, the prints are fine and screened and intended for films.

In a central drum machine, the drying is carried out in several stages: a drying between each color to allow to deposit the following color and a final drying "at heart".

The vacuum metallization technique consists in evaporating a metal which, in the case considered by the invention, is aluminum, on a support continuously moving over the evaporation zone. This evaporation takes place under vacuum. The evaporation sources are permanently supplied with the material to be deposited. The metal condenses on the support material to form a uniform metal layer. The heat energy absorbed by the support is dissipated by contact with a cooling cylinder.

The complexing technique is known to be of common use for producing complexed films. the complexing uses a laminating machine which at one of its ends receives a coil of raw material. This raw material receives a coating of solvent glue. By ventilation of hot air, the solvents are dried. Then, the support to be complexed is applied by strong pressure on the initial support. In the extreme second part of the machine, the material thus glued is wound.

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CLAIMS EP0468864

1.

A complexed printed packaging film, characterized in that it comprises the combination of: - a transparent polyester film (7); - a first layer of printing inks and a protective varnish (8) on a first face (9) of the polyester film (7); - a metal layer (10) on the first ink and printing layer (8); - a second layer of printing inks and a protective varnish (11) on the metal layer (10) opposite the first layer of printing and varnishing inks (8) , the film thus having visible impressions on the front and back.

2.

Film according to claim 1, characterized in that the first layer of inks and varnishes (8) is in contact with the polyester film (7).

3.

Film according to any one of claims 1, 2, characterized in that the metal layer (10) is in contact on the first layer of inks and varnish (8).

4.

Film according to any one of claims 1 to 3, characterized in that the second layer of inks and varnish (11) is in direct contact on the metal layer (10).

5.

Film according to any one of claims 1 to 3, characterized in that the second layer of inks and varnishes (11) is separated from the metal layer (10) by at least one intermediate layer (12).

6.

Film according to claim 5, characterized in that an intermediate layer (12) is a sheet of paper.

7.

Film according to claim 6, characterized in that an intermediate layer (12) is a plastic film.

8.

Film according to any one of claims 6 to 7, characterized in that an intermediate layer (12) is associated with the metal layer (10) by gluing, laminating, by means of a layer of adhesive (13).

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9.

Film according to any one of claims 1 to 8, characterized in that a layer of varnish (14) is associated with the polyester film (7) in contact with its second face (15).

10.

Film according to any one of claims 1 to 9, characterized in that the first layer of inks and varnishes (8) is deposited on the polyester film (7) by gravure or flexography.

11.

Film according to any one of claims 1 to 10, characterized in that the varnish of the first and second layer of inks and varnish is a nitrocellulose varnish.

12.

Film according to any one of claims 1 to 11, characterized in that the metal layer (10) is deposited by vacuum metallization.

13.

Film according to claim 8, characterized in that the glue of the adhesive layer (13) is of two-component polyurethane type.

14.

Film according to any one of claims 1, 4, 5, characterized in that the second layer of inks and varnishes (11) is deposited on the metal layer (10) or an intermediate layer (12) by gravure printing.

15.

Film according to Claim 9, characterized in that the lacquer of the lacquer layer (14) associated with the polyester film (7) is of the heat-sealable type on polystyrene, PVC, polypropylene or polyester.

16.

Film according to claim 1, characterized in that it is further constituted by a layer of heat-sealable varnish on polystyrene, PVC, polypropylene, polyester associated with the second side of the polyester film, the second layer of inks and varnish being in direct contact with the metal layer deposited by vacuum metallization.

17.

Film according to claim 1, characterized in that it is further constituted by a layer of heat-sealable varnish on polystyrene, PVC, polypropylene, polyester associated with the second side of the polyester film, the second layer of inks and varnish being associated with the metal layer deposited by vacuum metallization by an intermediate layer of paper or plastic by means of a layer of adhesive.

18.

A process for producing a complexed printed packaging film according to claim 1, characterized by the following successive steps: - the polyester film (7) is printed with ink and then the protective lacquer is deposited on the ink by gravure printing or flexography; the metal layer (10) is deposited by vacuum metallization on the ink and the varnish; the metal layer (10) is printed with ink and then the protective lacquer is deposited on the ink by gravure printing.

19.

A process for producing a complexed printed packaging film according to claim 1, characterized by the following successive steps: - the polyester film (7) is printed with ink and then the protective lacquer is deposited on the ink by gravure printing or

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flexography; the metal layer (10) is deposited by vacuum metallization on the ink and the varnish; - Laminating is carried out with an intermediate layer (12); the intermediate layer (12) is printed with ink and then the protective lacquer is deposited on the ink by gravure printing.

20.

Process according to any one of claims 19, 20, characterized in that it also comprises a subsequent step of depositing a varnish layer (14) on the polyester film (7) by gravure printing.

21.

Process according to any one of Claims 18 to 20, characterized in that it also comprises a final rewinding step of the film (1) thus produced.

22.

Container closure door, characterized in that it is obtained from a complexed packaging film (1) according to any one of claims 1 to 17.

23.

Container comprising a container (3) such as a plastic container or container and a closure seal (2) associated with the container (3) according to claim 22.

24.

Container according to claim 23, characterized in that the lid (2) is heat-sealed to the container (3).

25.

Container according to any one of Claims 23 and 24, characterized in that the cover (2) has visible impressions on the outside and on the inside.

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(54) **Multilayer composite material, in particular multilayer thermoplastic film, and relevant formed articles.**

(57) A multilayer composite, thermoplastic and thermosealable material, in particular a multilayer printable film is described, which consists f.i. of eight layers and is able to be fixed to formed bodies with detachement resistance gradients.

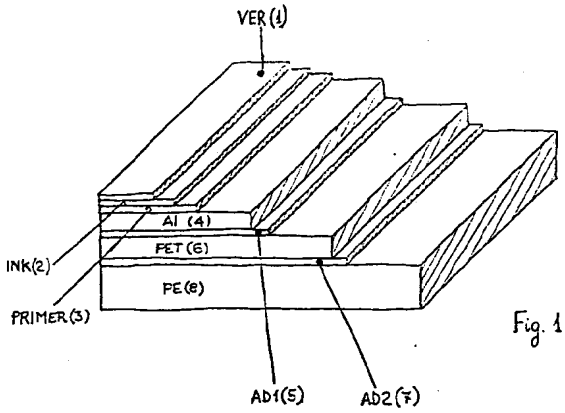


Fig. 1

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The present invention relates to a multilayer composite material, in particular a thermoplastic and thermosealable film.

In one of its embodiments the invention concerns a film or foil to form covers fixed on container rims with detachment resistance gradients.

Known is the wide use of containers, generally not big for istance for single-portion of substances, in particular of eatable mainly liquids, creams and the like.

Up to now these containers are formed with a top rim along which the cover is heat sealed. Generally the only care of ensuring to the content a nearly absolute protection leads to the use of an extremely resistant sealing seam of the cover to the container. The cover detachment takes then place under several difficulties and offen requires a good effort. This breakaway is difficultly controllable in the sense that f.i. once it has initiated at one end it extends quickly and out of comand on the whole open surface of the container causing also possible outwards splashings. Further after the partial or total opening the container cannot be closed, i.e. the cover is already out of use (besides under said effort the cover foil generally goes torn, broken, divided in several no more utilizable pieces).

To avoid these inconveniences easy-open covers have been made, however the sealing and the content protection are aleatory. The impossibility of reusing the cover and of taking out only a part of the content remains.

First object of the present invention is to provide a composite multilayer material, in particular a multilayer foil which allows the elimination of, among others, the above mentioned inconveniences and the realization of coverings, closings, overlaps and the like with detachment controllable resistances.

An other object of the invention is a multilayer film which is adapted to be fastened to other bodies with disjunction resistance gradients.

The present invention covers also: a simple method to manufacture said multilayer material; the formed articles obtained from the application of the relevant multilayer films.

These and other objects are reached with the material according to the invention which is characterized in that it comprises, proceding from the outside to the inside;

a) a layer of bright protective varnish VER(1) on a polyester or polyurethanes basis, which two components and a thickness of from 0,5 to 5gr/m^2;

b) a printing ink layer INK(2) on a nitrocellulose basis having a thickness increasing with the colour number increase from 2,5 to 7gr/m^2, preferably around 3gr/m^2 for a standard colours number;

c) a layer of diluting, pigment free primer PRIMER(3) on a nitrocellulose basis with a thickness of from 0,5 to 1,5gr/m^2;

d) an aluminum foil Al(4) with a thickness of from 5 to 25, preferably from 8 to 16 microns;

e)a first adhesive layer AD1(5) on a polyurethane basis having at least one component with a thickness from 1 to 5gr/m^2;

f) a polyethylenglycoltherephthalate film PET(6) having a thickness from 8 to 20 microns;

g) a second adhesive layer AD2(7) also on a two component polyurethane basis, which is able to absorb amide additives acting as slip agents, and has a thickness from 1 to 5gr/m^2;

h) a coextruded film formed of ethylene copolymers PE(8) having a thickness of from 20 to 100 microns.

In an advantageous and therefore prefered embodiment (also because it is suitable for several uses and satisfies a large range of requirements) the layer thicknesses are preferably and critically: for a) of about 2gr/m^2; for b) of about 3gr/m^2; for c) of about 1gr/m^2; for d) of about 12 microns; for e) of about 3gr/m^2; for f) of about 12 microns; for g) of about 2-3gr/m^2; and for h) of about 50 microns.

Preferably the coextruded film h) comprises a layer of ethylen-methacrylic acid copolymer (of the "surlin" type) and a layer of ethylen-vinylacetate copolymer, and other functional groups (of the Bynel CXA type).

An advantageous method to manufacture the above material comprises simply the three steps recited in claim 4.

The formed articles obtainable with the multilayer films according to the invention are numerous, among which we limit ourself to cite the closures, seals, covers, protections, overlayers, over-wrappings, dispensser, distributors etc. in particular the composite articles in which these films are coupled to supports (like cups, glasses containers etc. possibly also of small size), from at least a portion of which they can be disconnected or detached without difficulty and effort (f.i. by peeling) and/or from at least an other portion they can be very difficultly taken away.

The various aspects and advantages of the invention shall better appear from the description of the (not limitative) embodiments shown in the accompanyng drawings in which:

- fig. 1 is a schematic partially prospective front view, of a composite foil according to the invention;
- fig. 2 is a scheme of the manufacture method, and
- fig. 3A and 3B are partially prospective top views of an application example.

In fig.1, proceeding from the autside to the

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inside, the eight layers can be seen which have been above mentioned and are recited in claim 1. The preferred thicknesses are those indicated in claim 2.

The components for the above layers are generally those available on the market. However for the adhesive layers e) AD1(5) and g) AD2(7) special adhesives made by the Applicant and marked with the references P77 for AD1 and P78 and AD2 are preferably utilized.

As polyester film PET(6) a commercial film like DU PONT's 'Mylar" or ICI's "Melinex" can be used.

For the layer h) PE(8) a polyolefin based coextruded film is critically employed, more precisely a coextruded foil formed of a first film of ethylene (C2)-metacrylic acid copolymer (in an amount lower than 15%) f.i. DO PONT's "Surlin" and of a second film of ethylene-vinyl acetate copolymer (besides possible other functional groups) f.i. of DU PONT's Bynel CXA.

Fig.2 shows a scheme of an advantageous and thus preferred manufacturing method of the foil according to the invention, comprising: a step I of coupling of Al(4) and PET(6) also with the aid of adhesive AD1(5), a second step of printing; and a third step of coupling the foil coupled in I and printed in II with the support layer or film PE(8).

In figures 3A and 3B is shown one of the many applications of the foil of the invention: a container V of f.i. polystyrene, to be filled with milk, creams and the like (i.e. liquid and/or solid products) closed by a cover CO formed of the film of fig. 1 and fixed to the upper rims of V along a seam S with detachement resistance gradients. Indeed by controlling temperatures and/or pressure used for the connection of CO to V, a first zone A of the connection of CO to V is realized wherein CO can be detached by simply peeling CO from the upper rim of V until a hole or opening D of V is discovered, which allows a confortable and controllable exit of the content of V, the second zone B of CO being fixedly sealed to the rim of V and being practically undetachable. According to an advantageous feature of the invention, the first portion or zone of CO detached from V by simple peeling can be closed again under a light manual pressure and assures a good sealing even after several ouvertures and closures. In fig.3A the container V well closed and sealed by CO is shown; in fig. 3B the peelable portion B of CO has been easely raised and detached up to the seam S'.

Claims

1. Multilayer composite, substantially thermoplastic and thermosealable material, in particular multilayer film comprising at least a printed layer, a metallic layer, an intermediate layer, and a support layer, these layers being preferably coupled by means of adhesives, characterized in that, proceding from the outside to the inside, said material comprises:
   a) a layer of bright protective varnish VER-(1) on a polyester or polyurethanes basis, with two components and a thickness of from 0,5 to 5gr/m^2;
   b) a printing ink layer INK(2) on a nitrocellulose basis having a thickness increasing with the colour number increase from 2.5 to 7gr/m^2, preferably around 3gr/m^2 for a standard colours number;
   c) a layer of diluting, pigment free primer PRIMER(3) on a nitrocellulose basis with a thickness of from 0,5 to 1,5gr/m^2;
   d) an aluminum foil Al(4) with a thickness of from 5 to 25, preferably from 8 to 16 microns;
   e) a first adhesive layer AD1(5) on a polyurethane basis having at least one component with a thickness from 1 to 5gr/m^2;
   f) a polyethylenglycoltherephthalate film PET(6) having a thickness from 8 to 20 microns;
   g) a second adhesive layer AD2(7) also on a two component polyurethane basis, which is able to absorb amide additives acting as slip agents, and has a thickness from 1 to 5gr/m^2;
   h) a coextruded film formed of ethylene copolymers PE(8) having a thickness of from 20 to 100 microns.

2. Material according to claim 1, characterized in that the layer thicknesses are preferably and critically: for a) of about 2gr/m^2; for b) of about 3gr/m^2; for c) of about 1gr/m^2; for d) of about 12 microns; for e) of about 3gr/m^2; for f) of about 12 microns; for g) of about 2-3gr/m^2, and for h) of about 50 microns.

3. Material according to claim 1 or 2, characterized in that the coextruded film h) comprises a layer of ethylene-metacrylic acid copolymer (of the "Surlin" type) and a layer of ethylene-vynilacetate copolymer, and other functional groups (of the 'Binel CXA" type).

4. Method for the preparation of the material according to the above claims; substantially characterized in that it involves three steps:
   I) the alluminum foil d) is provided on one of its faces with adhesive layer e) and is coupled with the polyethylenglycoltherephthalate film f);
   II) the alluminum sheet is provided on its

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other face with the primer c), the ink layer b) and the varnish layer a) and is printed;
III) on the free face, opposite to the printing layer, of the composite, so printed film, the adhesive layer g) is applied and is coupled with the coextruded polyethylene-based film h).

5. Formed articles, in particular closures, seals, covers, protections, dispensers and the like, obtained with the material according to claims 1-3.

6. Formed articles substantially according to claims 5, fixed to supports with detachement resistance gradients.

7. Formed articled according to claim 6, sealed nearly irremovably on support portions and contemporaneously peelable from other zones of said supports.

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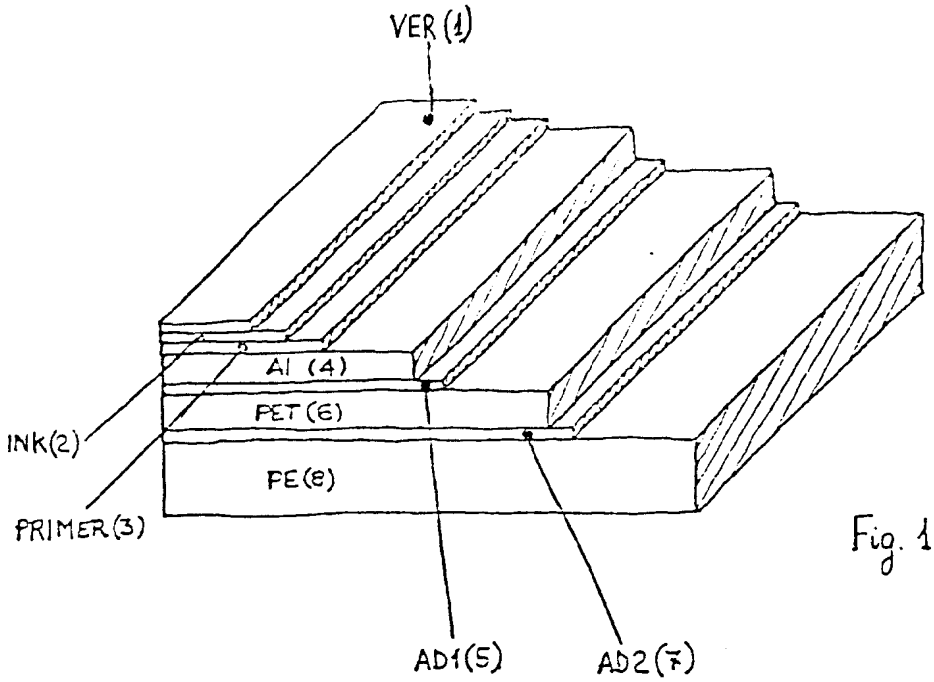


Fig. 1

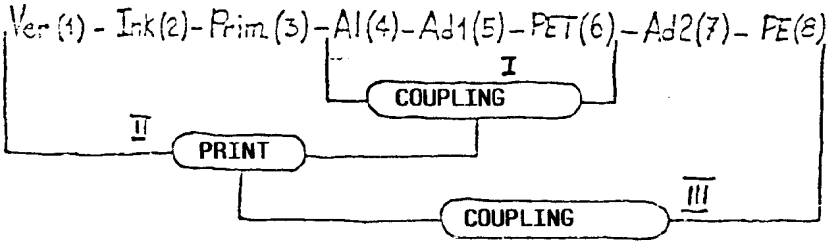


Fig. 2

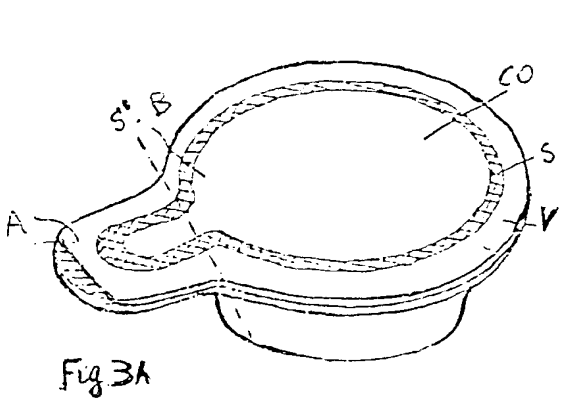


Fig 3A

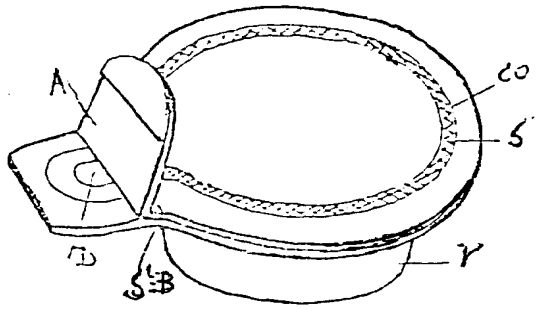


Fig. 3B

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(54) Cartridge and method for the preparation of whipped beverages.

(57) A cartridge (1) containing one or more beverage ingredients and being formed from substantially air and water-impermeable materials, the said cartridge comprising an inlet (4) for the introduction of an aqueous medium into the cartridge, a compartment (9) containing the beverage ingredient or ingredients (8), an outlet (5) for the beverage produced from the beverage ingredients and whipping means (18) provided in the path of the beverage prior to the outlet (5) to whip the said beverage.

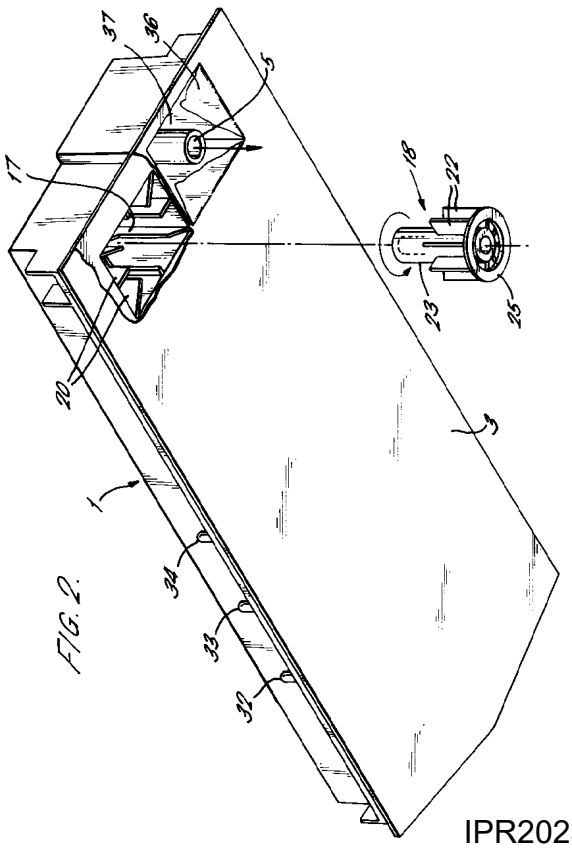


FIG. 2.

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The present invention relates to a cartridge and method for the preparation of whipped beverages and, in particular, to sealed cartridges which are formed from substantially air- and water-impermeable materials and which contain one or more ingredients for the preparation of beverages and to a method of preparing whipped beverages from such cartridges.

It has previously been proposed to seal beverage preparation ingredients in individual air-impermeable packages. For example, cartridges or capsules containing compacted ground coffee are known for use in certain coffee making machines which are generally termed "espresso" machines. In the production of coffee using these coffee machines the coffee cartridge is placed in a brewing chamber and hot water is generally caused to pass under pressure through the cartridge, thereby extracting the aromatic coffee constituents from the ground coffee and producing a coffee beverage. Typically in the production of "espresso" coffee a brewing time of about 25 seconds is used at a pressure of about 6 x 10^5 Pa.

Cartridges containing roast and ground coffee in which hot water flows under gravimetric force through the cartridge are also known. A cartridge of this general type is described in British Patent No. 1397116.

In our EP-A-0272922 there is described a package which contains at least one beverage preparation ingredient, e.g. roast and ground coffee. In a preferred embodiment the package is formed from a substantially air- and water-impermeable material and comprises a sealed body portion having a compartment containing the beverage ingredient and an outlet channel, the compartment and the outlet channel co-operating in such a manner that, in use, the beverage is filtered, thereby avoiding the necessity for an external filter.

There is also described in EP-A-0272922 a method for preparing a beverage which comprises positioning the beverage containing package at a brewing station, introducing water through water introduction means into the package, allowing the water to commingle with the beverage ingredient, and collecting the beverage so-formed through an outlet formed in the package.

The beverage packages as described in EP-A-0272922 are primarily intended to be used with a beverage preparation machine which handles the packages automatically or semi-automatically. A machine of this type is described in our EP-A-0334572. The packages may contain roast and ground coffee, leaf tea or one or more powdered beverage preparation ingredients such as powdered chocolate, powdered coffee or powdered soup.

The machines described in EP-A-0272922 operate at a relatively low pressure of less than 2 x 10^5 Pa and thus, although by varying the amount of water introduced into packages containing roast and ground coffee it is possible to obain a coffee beverage of the same strength as "espresso" coffee, it is not possible to incorporate gases into the coffee beverage at this pressure to provide the beverage with the foamed texture and appearance of "espresso" coffee.

We have now developed a cartridge operating at relatively low pressures which is capable of producing whipped beverages.

Accordingly, the present invention provides a cartridge containing one or more beverage ingredients and being formed from substantially air- and water-impermeable materials, the said cartridge comprising an inlet for the introduction of an aqueous medium into the cartridge, a compartment containing the beverage ingredient or ingredients, an outlet for the beverage produced from the beverage ingredients and whipping means provided in the path of the beverage prior to the outlet to whip the said beverage.

The cartridge which is used in the present invention may be of a known type, for example as described in EP-A-0272922 or EP-A-0455337, modified to include whipping means provided in the path of the beverage prior to the outlet.

The whipping means will generally comprise an impeller which is adapted to engage an external driving device on the beverage preparation machine, for example a machine of the type as described in EP-A-0334573. The impeller may comprise a rotor with a plurality of radial vanes, for example from 4 to 8 radial vanes. The vanes may be regularly or irregularly spaced, flat or curled, or offset, as desired. Preferably the rotor is provided with a hollow drive shaft which is adapted for engagement with the external driving device. The rotor may be made from a moulded plastics material such as polyacetal, for example Delrin (Registered Trade Mark) from DuPont, or polyester, or from nylon.

Preferably the impeller is positioned in a whipping chamber integrally formed within the cartridge, the beverage being diverted through this chamber before passing to the outlet. The whipping chamber is preferably provided with a plurality of fixed vanes or ribs formed integrally with the walls thereof. The whipping chamber is preferably also provided with means to position the impeller therein, for example, a cylindrical hole into which a drive shaft on the impeller is adapted to fit.

The cartridge of the present invention preferably has a body portion which may be formed, for example, from a moulded plastics material such as polypropylene. The inlet and/or outlet of the cartridge may be closed by a plug of a plastics material moulded into the inlet and/or outlet nozzle during the moulding of the body portion. Alternatively, the inlet and/or outlet may be covered by a substantially air- and water-impermeable material, for example aluminium foil or a laminated material, such as a laminate of plastic material/ metal foil/plastic material, prior to the opening

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of the inlet and/or outlet. Specific examples of materials which may be used are aluminium foil having a thickness in the range of from 30 to 60 micrometres coated with a layer of polypropylene or a laminate of polypropylene/aluminium foil/polyester.

The outlet in the cartridge may be prepared during the beverage preparation cycle using a cutting and piercing tool for example of the type as described in our EP-A-0334573.

Alternatively, the inlet and/or outlet may be open and the cartridge provided with an outer wrapping or the like. For example, a plurality of packages may be provided with a shrink wrapped outer layer.

In the cartridges of the present invention, the communication between the inlet and the compartment containing the beverage preparation ingredient(s) is preferably via a channel which is separated from the compartment by a wall which has a plurality of openings formed therein for the entry of a liquid medium into the compartment. The channel preferably extends along at least one side of the compartment, more preferably along three sides of the compartment. The openings in the wall are preferably in the form of elongate slots which are generally arranged in a manner such that an even distribution of the liquid medium through the beverage preparation ingredients is acheived.

The cartridge of the present invention may have a filter disposed between the compartment containing the beverage ingredient(s) and a least a part of the under surface of the top of the cartridge, one or more passages being formed between the filter and the top of the cartridge, the passages communicating with the outlet. This type of cartridge is particularly preferred when the beverage ingredient is roast and ground coffee.

The filter is preferably made from a material with a high wet strength, for example a non-woven polyester fibre material or polypropylene. Other materials which may be used include a water-permeable cellulosic material, such as a cellulosic material comprising woven paper fibres. The woven paper fibres may be admixed with fibres of polypropylene, polyvinylchloride and/or polyethylene. The incorporation of these plastics materials into the cellulosic material renders the cellulosic material heat-sealable. The filter material may also be coated with a material which is activated by heat and/or pressure so that it can readily be sealed to ribs formed in the under surface of the top of the package, thereby forming one or more passages which communicate with the outlet.

The beverage preparation ingredients contained in the cartridges of the invention are preferably roast and ground coffee, powdered chocolate, and according to individual taste, powdered milk or creamer, sugar or artificial sweetner.

It will be understood that it may be convenient for the compartment containing the beverage preparation ingredients to be separated into two or more sections, for example, one section containing roast and ground coffee and another section containing powdered milk or creamer. In such an arrangement the means for the entry of the liquid medium into the separate compartments would be varied to suit the requirements for filtration or dissolution of the particular ingredients.

The cartridge of the present invention, when filled with roast and ground coffee, preferably contains from 2.5 to 10 grams of roast and ground coffee, preferably from 4.5 to 7 grams for the preparation of a single cup. However, cartridges which are intended to provide multiple servings of coffee will contain an appropriate amount of roast and ground coffee, for example, packages intended to provide say five cups of coffee will contain from 20 to 50 grams of roast and ground coffee, preferably from 25 to 30 grams. The roast and ground coffee is generally compacted when the beverage package is filled in order to aid the distribution and transport of water through the package.

The cartridges of the present invention are preferably provided with at least one recognition means whereby, in use, the cartridge is identified by the machine into which it is placed for treatment and the identification of the cartridge thereby causes it to be subjected to the correct treatment steps including the introduction of the aqueous medium into the cartridge and the activation of the whipping means.

The recognition means may comprise one or more surface features formed in the body of the cartridge. For example, the cartridge body may be provided with one or more indents, cut outs, protrusions or holes which can be identified by a mechanical sensor in the beverage preparation machine, the mechanical sensor registering the presence or absence of the indents, cut outs, protrusions or holes.

The recognition means may, alternatively, comprise a system which can be sensed by a simple optical device, for example a bar code printed onto the body of the cartridge, a pattern of through holes in the cartridge, a pattern of contrasting tones or colours printed onto the cartridge or cartridges containing different comestibles being of different colours.

The recognition means may also comprise one or more strips of a magnetic material applied to the body of the cartridge which can be read by an appropriate magnetic sensor; one or more shaped or divided areas of metal foil applied to the cartridge body which cause an inductive effect on movement of the cartridge in the machine, which inductive effect can be sensed; or one or more electrically conductive areas formed on the body of the cartridge which can be sensed electrically.

As mentioned above, the cartridge of the present invention contains one or more beverage preparation ingredients, for example, roast and ground coffee or leaf tea and sugar and/or creamer, as desired. One

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machine which can readily be adapted for the preparation of a beverage from the preferred cartridge of the invention which includes a recognition means is described in our EP-A-0334573. The only modification required to be made to such a beverage preparation machine is to incorporate an appropriate sensor or sensors into it, the sensor or sensors being designed to read the particular coding on the cartridge and to send a signal to the controller, which then selects the appropriate beverage preparation cycle and activates the whipping means.

The sensor may be, for example, a mechanical sensor, an optical sensor, a magnetic sensor, an electrical sensor or an inductive sensor. The machine is preferably adapted so that the cartridge is handled automatically following its insertion into the machine.

The present invention also includes within its scope a method for the production of a whipped beverage from a cartridge containing one or more beverage ingredients, which method comprises introducing an aqueous medium into the cartridge, extracting constituents from the beverage ingredient(s) and/or dissolving the beverage ingredient(s) to form a beverage, whipping the beverage so produced and collecting the whipped beverage as it leaves the cartridge.

The whipping of the beverage, for example by means of an impeller, will generally incorporate air into the beverage to produce a foamy, frothy beverage. Beverages which can be produced in this manner are, for example, whipped chocolate and espresso-type coffee. Preferably the whipping of the beverage to incorporate air therein will result in from 5 to 30 percent by volume of air being incorporated into the beverage as bubbles having a bubble size preferably of below 300 micrometres, more preferably in the range of from 10 to 200 micrometres. Generally, whipped chocolate will incorporate a higher percentage of air by volume therein than whipped coffee.

Alternatively, the whipping of the beverage may be used to produce carbonated drinks. For example, the aqueous medium introduced into the cartridge may be carbonated water. On contact with powdered ingredients or a syrup for the preparation of a beverage the carbonated water will generally loose some of the carbon dioxide incorporated therein. The whipping of the beverage reintroduces into the beverage at least some of the carbon dioxide which has been lost from solution during the passage of the carbonated water through the cartridge. Alternatively, carbon dioxide may be introduced into the cartridge before the beverage is whipped, for example by direct passage into the chamber which contains the whipping means.

The present invention will be further described with reference to the accompanying drawings, in which:-

Figure 1 is a perspective view from above of a beverage cartridge of the invention;

Figure 2 is a perspective view from below of the beverage cartridge of Figure 1;

Figure 3 is a section through the beverage cartridge of Figure 1 along the lines III-III;

Figure 4 is a section through the beverage cartridge 1 along the line IV-IV;

Figure 5 illustrates one variant of an external driving mechanism;

Figure 6 illustrates another variant of an external driving mechanism;

Figure 7 illustrates a part of the driving mechanism of Figure 6 on a larger scale; and

Figure 8 illustrates a rotor of the beverage cartridge with which the driving mechanism engages.

Referring to the drawings, a cartridge of the present invention is shown generally at 1. The cartridge is mainly formed from a moulded plastics material and has a top 2 which may be decorated to identify the contents of the capsule, or which may have foil or paper laminated thereto with appropriate identification thereon. The bottom 3 of the capsule may be formed from an aluminium foil or a laminated foil.

The cartridge 1 has an inlet 4 and an outlet 5 which are formed in use of the cartridge by piercing or cutting the material covering the inlet and outlet openings.

As best shown in Figure 4, water enters the cartridge 1 via inlet 4 where it enters channel 6 formed along the edges of the package and communicates via slots 7 with the beverage ingredients 8 which are contained in a compartment within the cartridge. The water mixes with the beverage preparation ingredients contained within compartment 9 and is forced upwardly through the beverage preparation ingredients. The beverage formed by passage of water through the beverage preparation ingredients passes through filter material 10 into a plurality of passages which are formed between ribs 12 onto which the filter paper is sealed. The sealing of the filter material onto ribs 12 prevents any short circuit and all of the beverage has to pass through the filter. The passages 11 are closed at the end remote from the outlet by transverse rib 13. The beverage collected via passages 11 is funneled in area 14 in the direction as shown by the arrows and passes through inlets 15 and 16 to a whipping chamber 17 in which a rotor 18 is disposed.

The whipping chamber 17 has a plurality of fixed vanes 20 provided therein, as best shown in Figure 2. The whipper chamber 17 is provided with a hole 21 into which rotor 18 is adapted to fit. The rotor 18 is provided with a plurality of vanes 22 positioned around the central hollow drive shaft 23. The hollow drive shaft 23 has ribs 24 which are adapted for engagement with an external driving device. The rotor has an annular ring 25 fixed to the bottom of the vanes 22 which, in use, is lubricated by the beverage and the

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film of liquid between the annular ring and the bottom surface 3 of the cartridge 1 acts as a bearing. The film of liquid assists in pushing the rotor upwards and assists in cooling the under surface of the ring 25.

The drive shaft 23 of rotor 18 engages by means of ribs 24, an external driving mechanism which causes the rotor to rotate at very high speeds, for example at a speed of from 10,000 to 20,000 rpm. Air is drawn into the whipping chamber by a passage through the space provided between the edges of the hole 21 and the drive shaft 23. The rotor 18 rotates freely in the whipping chamber 17 and the high speed of the rotor causes considerable turbulence with the passage of the rotor vanes 22 close to the fixed vanes 20 in whipping chamber 17. The rotation of the rotor 18 in whipping chamber 17 causes a centrifugal/centripetal effect on the beverage which causes a negative pressure in the area of the base of the shaft 23 of the rotor 18 which draws air into the whipping chamber 17. This has two benefits, namely it obviates the need for a seal on the shaft 23 and provides the air to incorporate into the beverage in the form of bubbles. The whipped beverage then exits from the whipping chamber 17 in the direction as shown by the arrows in Figure 3 to the outlet 5 from the capsule.

The cartridge as described with reference to Figures 1 to 4 is suitable for insertion into a beverage preparation machine, for example of the type as described in EP-A-0334573 longitudinally through a slot.

The cartridge is also provided, as best shown in Figure 1 with teeth 30 moulded along one side edge of the cartridge. The teeth 30 have recessess 31 formed therebetween. The teeth 30 are intended to enable the cartridge to be driven through a beverage preparation machine by the engagement of the teeth 30 with the tooth (not shown) of a cam 35 as shown in Figure 5.

The side edge of cartridge 1 opposite to the edge provided with teeth 30 has a plurality of pegs 32, 33 and 34 provided thereon. As the package is driven into the machine by the engagement of teeth 30 with cam 35, the presence or absence of the upstanding pegs 32, 33, 34 is sensed by a sensing arm (not shown). If one or more of pegs 32, 33, 34 is not present the sensing arm will thereby identify a different type of cartridge. The sensing arm operates a switch (not shown) which thereby transmits information concerning the presence or absence of the pegs on the package to the control mechanism for the beverage dispensing machine. The arrangement of pegs 32, 33, 34 on the cartridge thus identifies the type of cartridge to a controller which then selects the appropriate beverage preparation conditions.

When the beverage preparation machine has selected the appropriate beverage preparation conditions, the water inlet 4 of the package is pierced or cut, the outlet 5 in the package is uncovered and the foil 36 originally covering the outlet folded back into an outlet surround chamber 37. Water is caused to flow under pressure through the compartment containing the beverage ingredients and, after whipping, the chosen beverage is then collected in a cup or receptacle placed below the outlet 5 of the package.

The rotor 18 of the cartridge is driven by an external drive mechanism, one variant of which is shown in Figure 5. The external drive mechanism shown in Figure 5 comprises a drive wire 40 with a shaped end 41. The drive wire 40 is mounted through a sliding drive 42 and a bearing bush 43. The drive wire 40 is driven by motor 44 which is attached to a motor mounting arm 45. The flexible end 41 of driving wire 40 is adapted to pierce the foil covering the drive shaft 23 of the rotor and to engage the ribs 24 of the rotor 18. The flexibility of the drive wire 40 allows for some mis-alignment and also reduces noise which would be caused by any mis-alignment. The flexibility also allows for motor 44 to be non-critically mounted.

The high speed motor 44 is caused to move in an arc by a cam action from the main cam 35 of the brewing mechanism. The motor mounting arm 45 is also provided with a sensing arm 46 which senses the depth of the cartridge inserted into the brewing machine at location 50 thereof. If the depth of the ledge at 50 is the correct depth for the beverage to be produced from the capsule to require whipping, then the tip 41 of the drive wire will be caused to penetrate the foil covering the rotor drive shaft 23 and to engage the ribs 24 thereof. Accordingly, the brewing machine will then cause the motor 44 to be switched on and whip the beverage by means of the rotation of flexible drive 41 being transmitted to the rotor 18.

If the capsule is not of the type which requires whipping, i.e. if sensor 46 does not sense the correct depth of ledge 50, then an override spring arm 51 will be depressed, but the driving device will not penetrate the top foil of the cartridge and the motor 44 will not be activated.

Referring to Figure 6, a second variant of an external drive mechanism is shown. The drive mechanism comprises a driving dog 60 which is attached through ferrule 61 to a motor 62. The motor is located within a motor mount 63 by means of claws 64 and 65. The upper arm 66 of the motor mount 63 has a spherical shaped under surface (not shown) which allows the motor to rock in all directions and therefore allows the alignment of the driving dog in the rotor shaft, as more fully described below with reference to Figures 7 and 8.

The motor mount 63 is supported by a motor carriage 70 via the spherical under surface of the upper arm 66 of the motor mount, allowing the motor angular motion as discussed above.

The operation of the device to engage the driving dog 60 of the rotor described below with reference to Figure 8 is driven by a track in the main cam of a brew-

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ing mechanism as described with reference to European Patent No. 0334573 (not shown). This cam operates a peg 71 in a cam follower lever 72 which pivots on a support 73 of the side plate 74 of the brewing mechanism. The position of the cam (not shown) ensures that the capsule is correctly placed before the lever 72 is operated. The lever 72 is moved downwards and causes the motor carriage to move downwards via a spring 75 one end of which is located on peg 76 of the cam follower lever and one end of which is located on peg 77 on the motor carriage 70. The motor carriage 70 is provided with a feeler blade 78 which is adapted to sense if the capsule is of the type the beverage from which will require whipping. When the capsule is of the correct type the feeler locates at a lower position on the capsule than if it is not of the correct type which allows the driving dog to press onto and pierce the foil covering the rotor drive shaft. The motor is then switched on due to the sensing of the correct capsule and the electrical and software control supplying power to the motor.

The movement of the motor carriage in the vertical direction is achieved by means of two guides positioned on the side plate 74 of the brewing mechanism. One guide 79 is shown which locates in a complementary slot 80 on the motor carriage. The other guide is not shown.

At the end of the brewing cycle, when the whipping of the beverage is complete, the cam follower lever 72 bears against the ledge 81 on the motor carriage thereby to ensure that the driving dog 60 is positively removed from the capsule by the action of the lever 72.

The driving dog 60 is shown on a larger scale in Figure 7. The driving dog has a pointed end 85 which is adapted to pierce the film which covers the aperture 90 of the rotor shown in Figure 8. The driving dog has a shaft 86 which is attached to the ferrule 61 shown in Figure 6. The pointed end 85 of the driving dog is attached via a section 87 of circular cross section to a flat section 88.

In operation, the driving dog pierces the film covering the aperture 90 of the rotor 89 and enters the hollow drive shaft 91 of the rotor 89. The drive shaft 91 of the rotor 89 is provided with two opposing pairs of splines 92 and 93 which centre section 87 of the driving dog. The pair of splines 92 are higher than the opposing pair of splines 93. This arrangement ensures that as the driving dog 60 enters the shaft 91 of the rotor 89 it is rotated until the shaft 88 is in aligned between, or to one side, of the two adjacent higher splines 92. This arrangement also prevents the flattened section 88 from attempting to pass down the same side of the opposing splines, particularly if the driving dog is entering at an angle.

The rotor 89 as shown in Figure 8 is provided with a plurality of blades 95 which are connected to the central shaft 96 of the rotor and at their lower outer edges to an annular ring 97 which also acts as a liquid bearing surface. A gap 99 is provided between the annular ring 97 and the central shaft 96 of the rotor which allows passage of liquid beneath the ring to assist in lubrication of the rotor as it bears against the bottom surface 3 of the cartridge.

The rotor 89 is also provided with a plurality of lugs 98, one of which is shown in Figure 8, which assist in retaining the rotor in the capsule during the manufacturing process by means of an interference fit within the hole 21 of the capsule into which the rotor fits (see Figure 3). Alternatively, the hole 21 may be provided with a shoulder (not shown) upon which the lugs 78 rest when the rotor is located in the hole during manufacture. The film of liquid between the bottom surface of the ring 97 and the surface 3 of the cartridge assists in pushing the rotor upwards within the hole 21 of the cartridge. In one embodiment where the hole 21 is provided with a shoulder on which lugs 98 rest, the upwards movement of the rotor prevents the lugs from rubbing on the shoulder and, as previously described, assists in cooling the under surface of the annular ring 97.

Claims

1. A cartridge containing one or more beverage ingredients and being formed from substantially air- and water-impermeable materials, the said cartridge comprising an inlet for the introduction of an aqueous medium into the cartridge, a compartment containing the beverage ingredient or ingredients, an outlet for the beverage produced from the beverage ingredients and whipping means provided in the path of the beverage prior to the outlet to whip the said beverage.

2. A cartridge as claimed in claim 1 wherein the whipping means comprises an impeller adapted to engage an external driving device.

3. A cartridge as claimed in claim 2 wherein the impeller comprises a rotor with a plurality of radial vanes.

4. A cartridge as claimed in claim 3 wherein the rotor has a hollow drive shaft adapted for engagement with the external driving device.

5. A cartridge as claimed in any one of the preceding claims wherein the whipping means is positioned in a chamber integrally formed within the cartridge.

6. A cartridge as claimed in claim 5 wherein the chamber has a plurality of fixed vanes provided therein.

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7. A cartridge as claimed in any one of the preceding claims wherein the inlet and/or outlet is covered by a substantially air- and water-impermeable material prior to the formation, in use, of the inlet and/or outlet in the cartridge.

8. A cartridge as claimed in any one of the preceding claims wherein a channel communicates with the inlet for the entry of an aqueous medium into the package, the channel being separated from the compartment containing the beverage ingredient or ingredients by a wall which has a plurality of openings formed therein for the entry of the aqueous medium into the compartment containing the beverage preparation ingredient(s).

9. A cartridge as claimed in claim 8 wherein the channel extends along at least one side of the compartment containing the beverage preparation ingredient(s).

10. A cartridge as claimed in claim 8 or claim 9 wherein the channel extends around three sides of the compartment containing the beverage preparation ingredient(s).

11. A cartridge as claimed in any one of claims 8 to 10 wherein the openings comprise a plurality of elongate slots.

12. A cartridge as claimed in any one of the preceding claims wherein a filter is disposed between the compartment and at least a part of the under surface of the top of the cartridge, one or more passages being formed between the filter and the top of the cartridge, which passage(s) communicate(s) with the outlet.

13. A cartridge as claimed in claim 12 wherein the filter is made from a water-impermeable material.

14. A cartridge as claimed in any one of the preceding claims wherein the beverage preparation ingredient is powdered chocolate or roast and ground coffee.

15. A cartridge as claimed in any one of the preceding claims which is provided with at least one recognition means whereby, in use, the cartridge is identified by the machine into which it is placed for treatment therefrom and the identification of the cartridge thereby causes it to be subjected to the correct treatment steps including the introduction of a aqueous medium into the cartridge and the engagement of the whipping means by an external driving device incorporated into the machine.

16. A cartridge as claimed in claim 15 wherein the recognition means comprises one or more surface features formed in the body of the cartridge.

17. A method for the production of a whipped beverage from a cartridge containing one or more beverage ingredients, which method comprises introducing an aqueous medium into the cartridge, extracting constituents from the beverage ingredient(s) and/or dissolving the beverage ingredient(s) to form a beverage, whipping the beverage so produced and collecting the whipped beverage as it leaves the cartridge.

18. A method as claimed in claim 17 wherein the beverage is whipped by means of an impeller.

19. A method as claimed in claim 17 or claim 18 wherein the whipping of the beverage incorporates air therein.

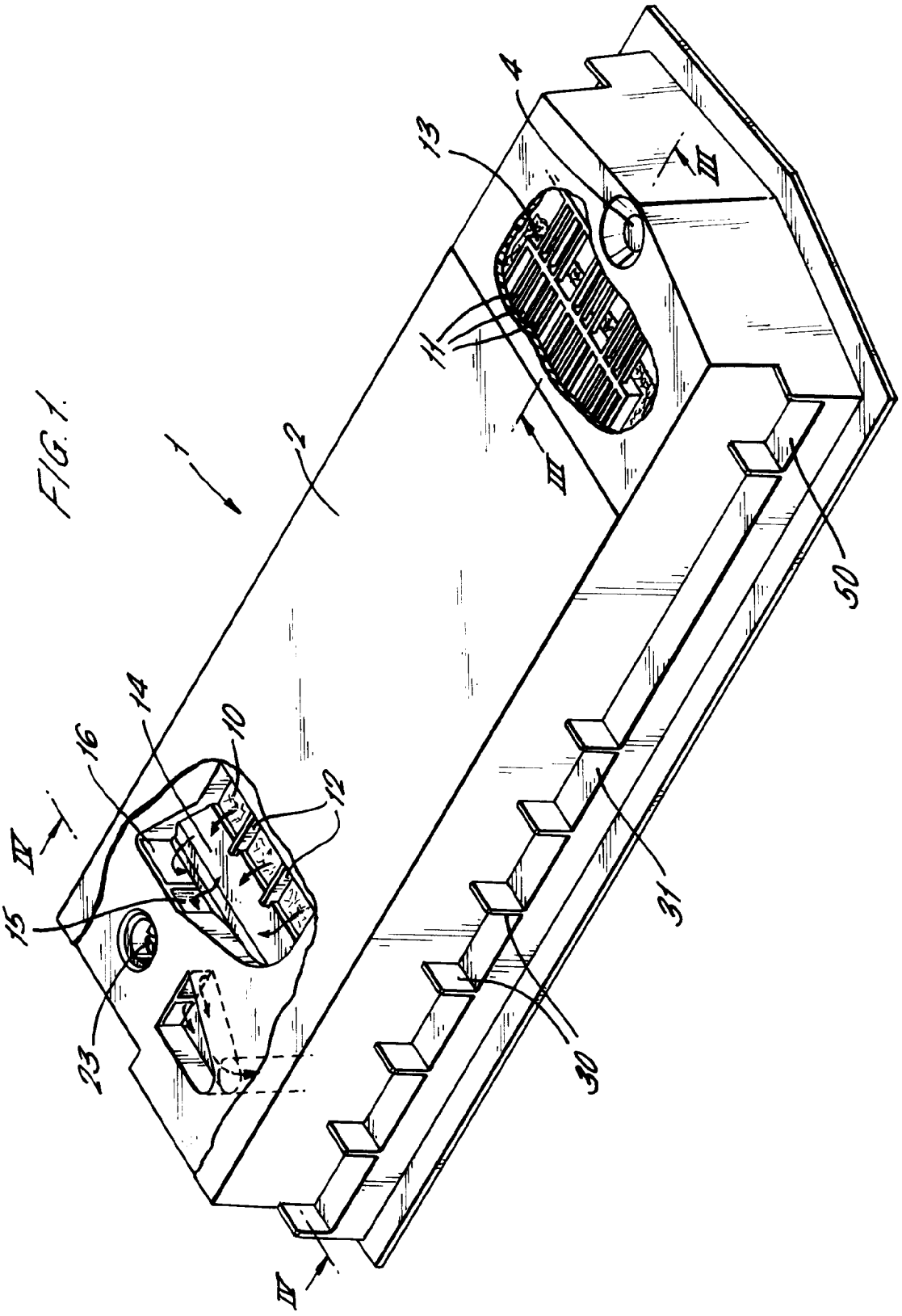
20. A method as claimed in claim 17 or claim 18 wherein carbon dioxide is introduced into the cartridge before the beverage is whipped.

21. A method as claimed in claim 17 or claim 18 wherein the aqueous medium is carbonated water and the whipping of the beverage reintroduces into the beverage any carbon dioxide lost from solution during the passage of the aqueous medium through the cartridge.

22. A method as claimed in any one of claims 17 to 19 wherein the beverage produced is whipped chocolate or espresso-type coffee.

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FIG. 1.



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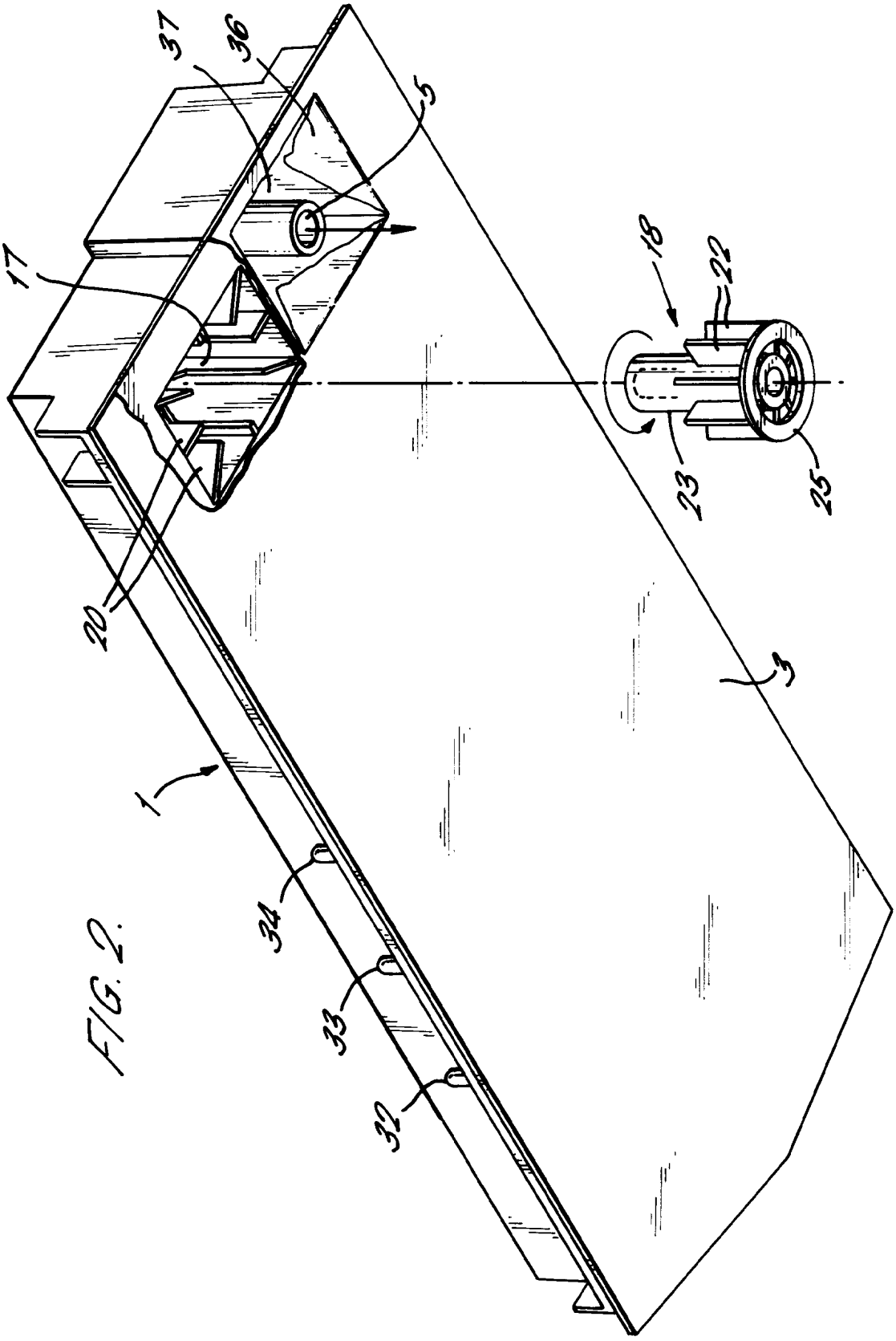


FIG. 2.

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FIG. 3.

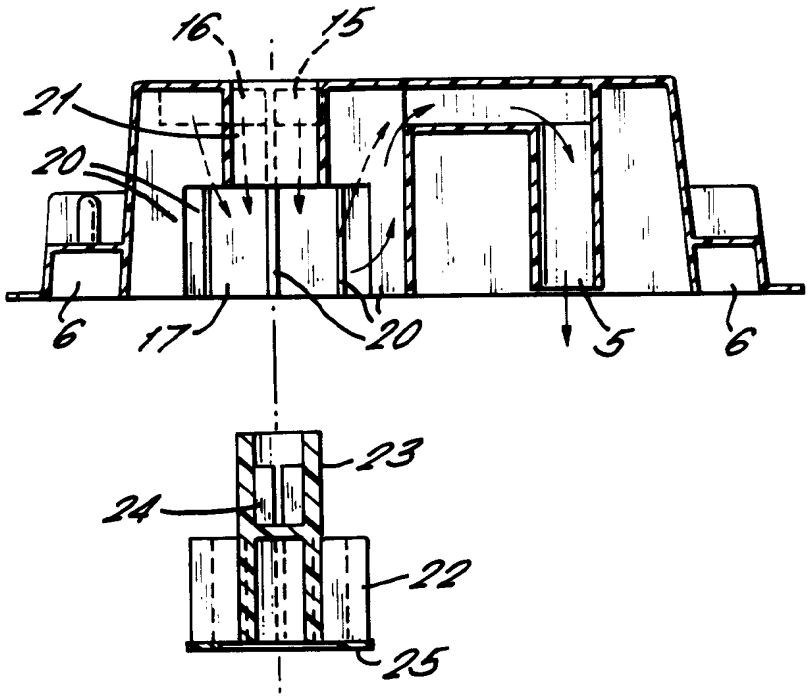
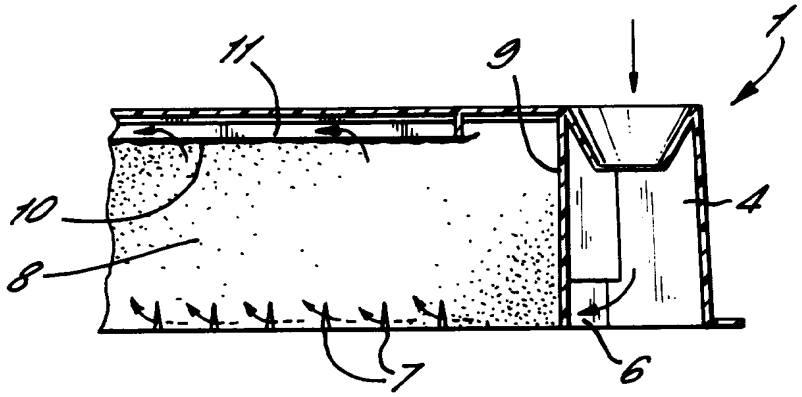
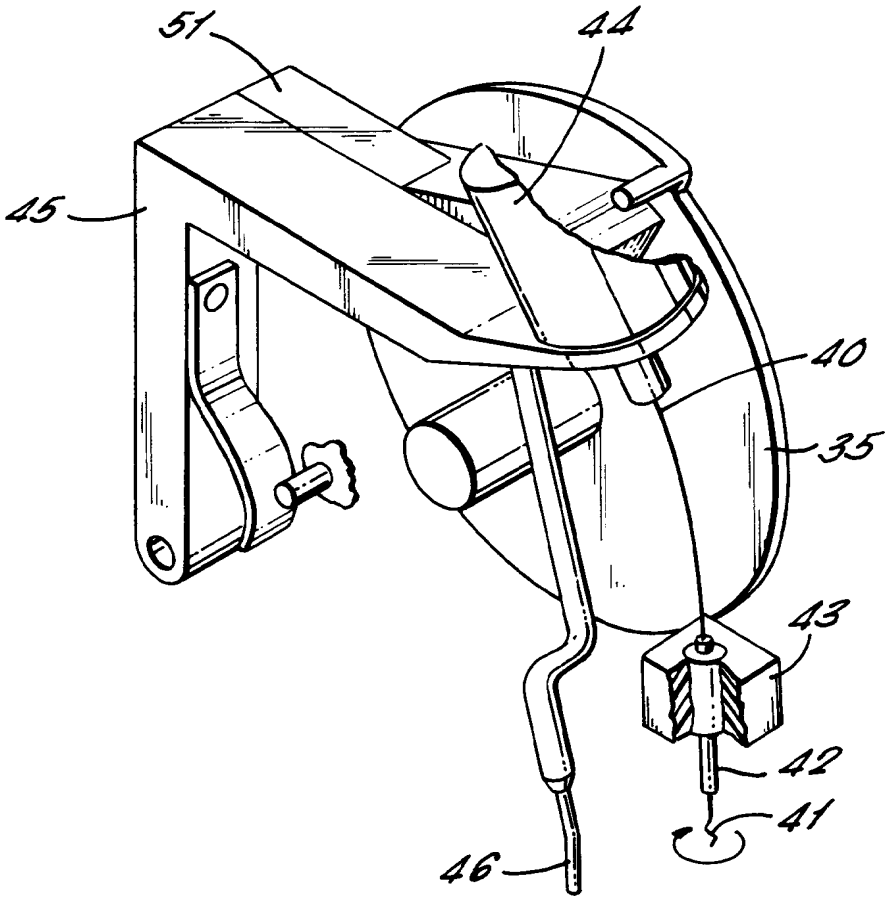


FIG. 4.



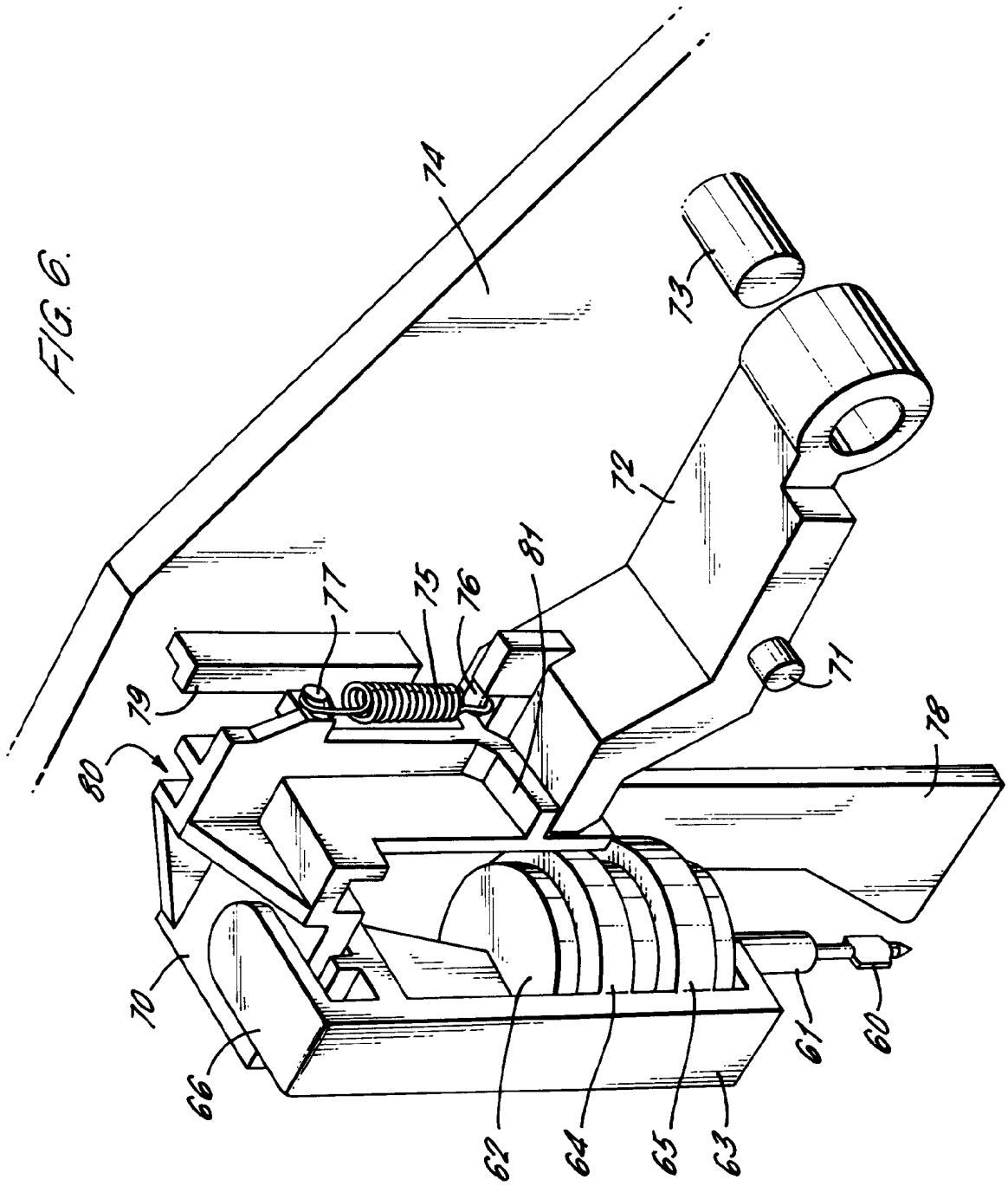
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FIG. 5.



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FIG. 6.



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FIG. 7.

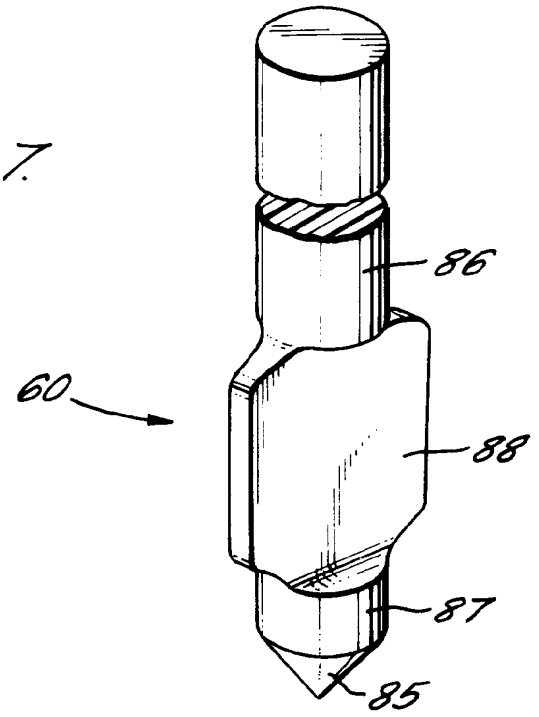
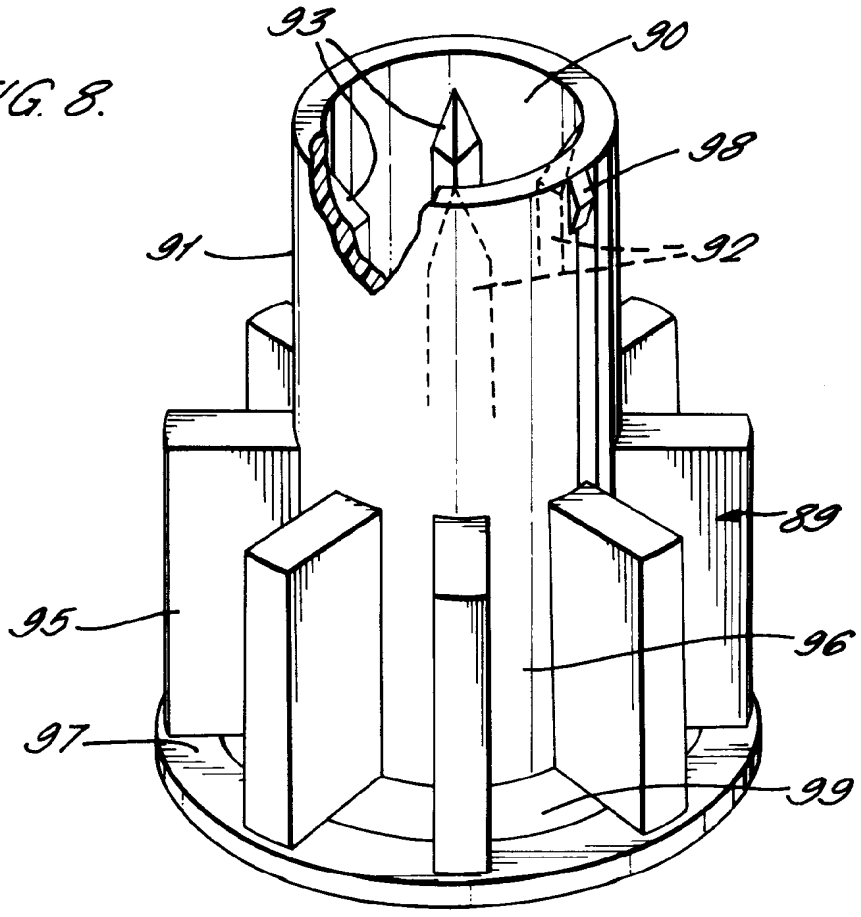


FIG. 8.



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European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 30 5730

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A,D	EP-A-0 455 337 (KRAFT GENERAL FOODS) * the whole document * ---	1,7-12, 14-17,22	B65D81/34

TECHNICAL FIELDS SEARCHED (Int.Cl.6)
B65D A47J

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	7 November 1994	Bridault, A

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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(54) Verpackungsfolie

(57) Eine Verpackungsfolie (10) zum Verschliessen von Behältern durch Heisssiegeln umfasst zwei über eine Klebstoffschicht (16) miteinander verbundene Filme aus Polyethylenterephtalat (PET). Ein erster PET-Film (12) weist eine Bedruckung (14) und der zweite PET-Film (18) eine Heisssiegelschicht (20) auf. Die Verpackungsfolie klebt nicht an Siegelwerkzeugen und ist auf schnell laufenden FFS-Maschinen einsetzbar.

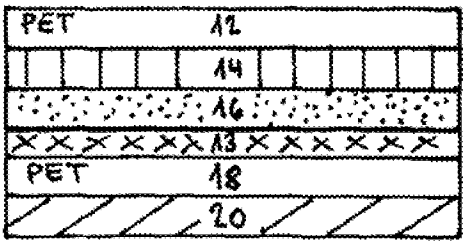


Fig. 1

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Beschreibung

[0001] Die Erfindung betrifft eine Verpackungsfolie zum Verschliessen von Behältern durch Heisssiegeln.

[0002] Bekannte Deckfolien zum Verschliessen von Behältern aus Kunststoff durch Heisssiegeln der Folie gegen den Behälterrand sind beschichtete oder unbeschichtete Aluminiumfolien sowie verschiedene Verbundfolien aus Papier und PET oder Papier/Aluminium-Laminate.

[0003] Der Erfindung liegt die Aufgabe zugrunde eine Verpackungsfolie der eingangs genannten Art zu schaffen, die gegenüber herkömmlichen Verpackungsfolien ein geringeres Gewicht aufweisen und damit zu einer niedrigeren Ökosteuer führen. Weiter soll die Verpakkungsfolie einen Hochglanzdruck ermöglichen, den Schutz der Bedruckung garantieren und ein Kleben der Folie an den Siegelwerkzeugen verhindern. Zudem soll die Verpackungsfolie auf schnell laufenden FFS-Maschinen einsetzbar sein.

[0004] Zur erfindungsgemässen Lösung der Aufgabe führt eine Verpackungsfolie mit zwei über eine Klebstoffschicht miteinander verbundenen Filmen aus Polyethylenterephtalat (PET), wobei ein erster PET-Film eine Bedruckung und der zweite PET-Film eine Heisssiegelschicht aufweist.

[0005] Eine bevorzugte Heisssiegelschicht ist auf einem Lack auf der Basis von Copolymeren aus Ethylen und Vinylacetat, Vinylacetat und Vinylchlorid oder auf der Basis von Acrylat aufgebaut. Die Heisssiegelschicht kann auch eine Extrusionsbeschichtung sein.

[0006] Die mit der Bedruckung versehene Seite des ersten PET-Films kann auf der Folienaussenseite liegen und ist in diesem Fall mit einer hitzebeständigen Schutzlackschicht versehen. Der zweite PET-Film kann metallisiert, weiss oder transparent sein. Der erste PET-Film mit der Bedruckung kann ebenfalls metallisiert, weiss oder transparent sein.

[0007] Die Metallisierung ist hier das bevorzugte Verfahren, dem PET-Film und damit der Verpackungsfolie Barriereeigenschaften zu verleihen und damit den Durchtritt von Flüssigkeiten, Gasen, Dämpfen, Wasserdampf, Aromen oder Geruchstoffen zu verhindern. Eine bevorzugte Metallisierung besteht aus Aluminium, das beispielsweise durch Sputtern oder durch Abscheidung aus dem Vakuum auf den ersten oder zweiten PET-Film in einer Dicke von etwa 10 nm bis etwa 2 µm aufgetragen wird.

[0008] Das Bedrucken des ersten PET-Films kann mit allen bekannten Druckverfahren vorgenommen werden, so z.B. Buch-, Offset-, Flexo-, Sieb-, Hello- und Kupfertiefdruck, aber auch Laserdruck, Inkjet, elektrofotografische und magnetografische Druckverfahren. Die Wahl, welches Druckverfahren zur Anwendung kommt, hängt von der gewünschten Druckqualität, von den jeweiligen technischen Gegebenheiten und der Auflagenhöhe ab. Die zweite Schutzlackschicht schützt das Druckbild, wenn dieses auf der Folienaussenseite liegt.

[0009] Die mit der Bedruckung versehene Seite des ersten PET-Films kann auch auf der Folieninnenseite liegen, wobei in diesem Fall der erste PET-Film transparent ist.

[0010] Der zweite PET-Film mit der Heisssiegelschicht kann transparent, weiss oder metallisiert sein.

[0011] Bevorzugt enthält die Klebstoffschicht einen für Schneidmesser geeigneten Schmierstoff, z.B. ein Pulver aus TiO_2, insbesondere ein Pulver mit TiO_2 -Partikeln mit einer mittleren Korngrösse von etwa 1 bis 10 µm.

[0012] Weitere Vorteile, Merkmale und Einzelheiten der Erfindung ergeben sich aus der nachfolgenden Beschreibung bevorzugter Ausführungsbeispiele sowie anhand der Zeichnung; diese zeigt schematisch in

- Fig. 1 den Schichtaufbau einer ersten Ausführungsform einer Verpackungsfolie in Hochglanzqualität;
- Fig. 2 den Schichtaufbau einer zweiten Ausführungsform einer Verpackungsfolie zur Verwendung als Vormaterial;
- Fig. 3 den Schichtaufbau einer dritten Ausführungsform einer Verpackungsfolie mit hoher Barrierequalität;
- Fig. 4 den Schichtaufbau einer alternativen Ausführungsform einer Verpackungsfolie mit hoher Barrierequalität.

[0013] Eine Verpackungsfolie 10 in Hochglanzqualität weist gemäss Fig. 1 folgenden Aufbau auf:

12 erster PET-Film, transparent, 6 bis 36 µm, z.B. 12 µm
14 Bedruckung, z.B. durch Helio- oder Flexografie
16 Klebstoffschicht, hergestellt durch Auftrag von

-in Lösungsmittel gelöstem Klebstoff, 2,0 bis 4,0 g/m², oder
-Klebstoff ohne Lösungsmittel, 1,3 bis 2,0 g/m², oder
-wässriger Klebstofflösung, 0,9 bis 6,0 g/m²,

mit einem Zusatz von TiO_2

18 Barriereschicht aus Aluminium, im Vakuum auf den PET-Film 12 aufgedampft, 10 nm bis 2 µm,
18 zweiter PET-Film, transparent, 6 bis 36 µm, z.B. 12 µm
20 Heisssiegelschicht, hergestellt durch Auftrag eines Lackes auf der Basis von

-Copolymeren aus Ethylen und Vinylacetat, 4,0 ± 0,5 g/m², oder
-Copolymeren aus Vinylacetat und Vinylchlorid, 4, 0 ± 0,5 g/m², oder
-Acrylat, 4, 0 ± 0,5 g/m²

[0014] Bei der Herstellung der Verpackungsfolie 10

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wird zunächst der als Druckträger dienende transparente erste PET-Film 12 bedruckt. Der zweite transparente PET-Film 18 wird auf einer Seite mit der Heisssiegelschicht 20 und auf der anderen Seite mit der Barriereschicht 13 und darüber mit der Klebstoffschicht 16 mit einem Zusatz von TiO_2 -Pulver versehen. Anschliessend wird der mit der Heisssiegelschicht 20 versehene transparente metallisierte zweite PET-Film 18, 13 über die Klebstoffschicht 16 mit dem bedruckten transparenten ersten PET-Film 12, 14 zur Verpackungsfolie 10 verklebt.

[0015] Die unbedruckte Seite des transparenten ersten PET-Films 12 bildet die spätere Aussenseite, die auf den transparenten metallisierten zweiten PET-Film 18, 13 aufgetragene Heisssiegelschicht 20 die Innenseite eines mit der Verpackungsfolie 10 verschlossenen Behälters.

[0016] Eine Verpackungsfolie 10 zur Verwendung als Vormaterial weist gemäss Fig. 2 folgenden Aufbau auf:

11 Schutzlackschicht aus einem Nitrocelluloselack, 1,1 ± 0,5 g/m²
14 Bedruckung, z.B. durch Helio- oder Flexografie
12 erster PET-Film, weiss, 6 bis 36 µm, z.B. 12 µm
16 Klebstoffschicht, hergestellt durch Auftrag von

-in Lösungsmittel gelöstem Klebstoff, 2,0 bis 4,0 g/m², oder
-Klebstoff ohne Lösungsmittel, 1,3 bis 2,0 g/m², oder
-wässriger Klebstofflösung, 0,9 bis 6,0 g/m²,

mit einem Zusatz von TiO_2
18 zweiter PET-Film, transparent, 6 bis 36 µm, z.B. 12 µm
20 Heisssiegelschicht, hergestellt durch Auftrag eines Lackes auf der Basis von

-Copolymeren aus Ethylen und Vinylacetat, 4,0 ± 0,5 g/m², oder
-Copolymeren aus Vinylacetat und Vinylchlorid, 4, 0 ± 0,5 g/m², oder
-Acrylat, 4, 0 ± 0,5 g/m²

[0017] Die in Fig. 2 gezeigte zweite Ausführungsform einer Verpackungsfolie 10 unterscheidet sich von der in Fig. 1 gezeigten Ausführungsform dadurch, dass der bedruckte erste PET-Film 12, 14 weiss ist und die Bedruckung 14 mit der Schutzlackschicht 11 die spätere Aussenseite, die auf den transparenten zweiten PET-Film 12 aufgetragene Heisssiegelschicht 20 die Innenseite eines mit der Verpackungsfolie 10 verschlossenen Behälters bildet. Bei dieser Ausführungsform ist eine Schutzlackschicht für die Bedruckung erforderlich. Zur Herstellung der Verpackungsfolie 10 wird auf gleiche Weise wie bei der vorstehend beschriebenen Ausführungsform von Fig. 1 der bedruckte weisse erste PET-Film 12, 14 gegen den mit der Klebstoffschicht 16 versehenen transparenten zweiten PET-Film 18 geklebt.

[0018] Eine Verpackungsfolie 10 mit hoher Barrierequalität weist gemäss Fig. 3 folgenden Aufbau auf:

11 Schutzlackschicht aus einem Nitrocelluloselack, 1,1 ± 0,5 g/m²
14 Bedruckung, z.B. durch Helio- oder Flexografie
12 erster PET-Film, transparent, 6 bis 36 µm, z.B. 12 µm
16 Klebstoffschicht, hergestellt durch Auftrag von

-in Lösungsmittel gelöstem Klebstoff, 2,0 bis 4,0 g/m², oder
-Klebstoff ohne Lösungsmittel, 1,3 bis 2,0 g/m², oder
-wässriger Klebstofflösung, 0,9 bis 6,0 g/m²,

mit einem Zusatz von TiO_2
13 Barriereschicht aus Aluminium, im Vakuum auf den PET-Film 12 aufgedampft, 10 nm bis 2 µm,
18 zweiter PET-Film, transparent, 6 bis 36 µm, z.B. 12 µm
20 Heisssiegelschicht, hergestellt durch Auftrag eines Lackes auf der Basis von

-Copolymeren aus Ethylen und Vinylacetat, 4,0 ± 0,5 g/m², oder
-Copolymeren aus Vinylacetat und Vinylchlorid, 4, 0 ± 0,5 g/m², oder
-Acrylat, 4, 0 ± 0,5 g/m²

[0019] Bei der Herstellung der Verpackungsfolie 10 wird zunächst der als Druckträger dienende transparente erste PET-Film 12 bedruckt. Anschliessend erfolgt der Auftrag der Schutzschicht 11. Der transparente zweite PET-Film 18 wird auf einer Seite mit der Heisssiegelschicht 20 und auf der anderen Seite mit der Barriereschicht 13 und darüber mit der Klebstoffschicht 16 versehen. Anschliessend wird der mit der Heisssiegelschicht 20 versehene transparente metallisierte zweite PET-Film 18 über die Klebstoffschicht 16 mit dem bedruckten und mit der Schutzschicht 11 versehenen weissen PET-Film 12, 14 zur Verpackungsfolie 10 verklebt.

[0020] Eine alternative Verpackungsfolie 10 weist gemäss Fig. 4 folgenden Aufbau auf:

12 erster PET-Film, transparent, 6 bis 36 µm, z.B. 12 µm
14 Bedruckung, z.B. durch Helio- oder Flexografie
16 Klebstoffschicht, hergestellt durch Auftrag von

-in Lösungsmittel gelöstem Klebstoff, 2,0 bis 4,0 g/m², oder
-Klebstoff ohne Lösungsmittel, 1,3 bis 2,0 g/m², oder
-wässriger Klebstofflösung, 0,9 bis 6,0 g/m²,

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mit einem Zusatz von TiO_2

18 zweiter PET-Film, weiss, 6 bis 36 µm, z.B. 12 µm

20 Heisssiegelschicht, hergestellt durch Auftrag eines Lackes auf der Basis von

-Copolymeren aus Ethylen und Vinylacetat, 4,0 ± 0,5 g/m², oder
-Copolymeren aus Vinylacetat und Vinylchlorid, 4, 0 ± 0,5 g/m², oder
-Acrylat, 4, 0 ± 0,5 g/m²

[0021] Die in Fig. 4 gezeigte alternative Verpackungsfolie 10 unterscheidet sich von der in Fig. 3 gezeigten Ausführungsform dadurch, dass der bedruckte erste PET-Film 12, 14 transparent ist und der weisse zweite PET-Film 18 auf einer Seite mit der Heisssiegelschicht 20 und auf der anderen Seite mit der Klebstoffschicht 16 versehen ist.

Patentansprüche

1. Verpackungsfolie zum Verschliessen von Behältern durch Heisssiegeln, **gekennzeichnet durch** zwei über eine Klebstoffschicht (16) miteinander verbundene Filme aus Polyethylenterephtalat (PET), wobei ein erster PET-Film (12) eine Bedruckung (14) und der zweite PET-Film (18) eine Heisssiegelschicht (20) aufweist.

2. Verpackungsfolie nach Anspruch 1, **dadurch gekennzeichnet, dass** die mit der Bedruckung (14) versehene Seite des ersten PET-Films (12) auf der Folienaussenseite liegt und mit einer hitzebeständigen Schutzlackschicht (11) versehen ist.

3. Verpackungsfolie nach Anspruch 2, **dadurch gekennzeichnet, dass** der erste PET-Film (12) mit der Bedruckung (14) transparent, weiss oder metallisiert ist.

4. Verpackungsfolie nach Anspruch 2, **dadurch gekennzeichnet, dass** der zweite PET-Film (18) transparent, weiss oder metallisiert ist.

5. Verpackungsfolie nach Anspruch 1, **dadurch gekennzeichnet, dass** die mit der Bedruckung (14) versehene Seite des ersten PET-Films (12) auf der Folieninnenseite liegt und der erste PET-Film (12) transparent ist.

6. Verpackungsfolie nach Anspruch 5, **dadurch gekennzeichnet, dass** der zweite PET-Film (18) mit der Heisssiegelschicht (20) transparent, weiss oder metallisiert ist.

7. Verpackungsfolie nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** die Klebstoffschicht (16) einen für Schneidmesser geeigneten Schmierstoff enthält.

8. Verpackungsfolie nach Anspruch 7, **dadurch gekennzeichnet, dass** der Schmierstoff Titandioxid (TiO_2) ist.

9. Verpackungsfolie nach einem der Ansprüche 1 bis 8, **dadurch gekennzeichnet, dass** die Heisssiegelschicht (20) eine Extrusionsschicht ist.

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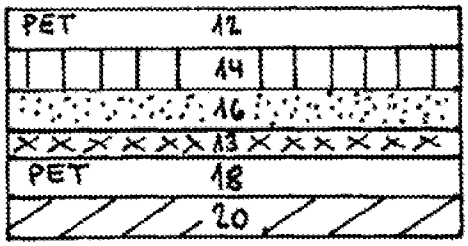


Fig. 1

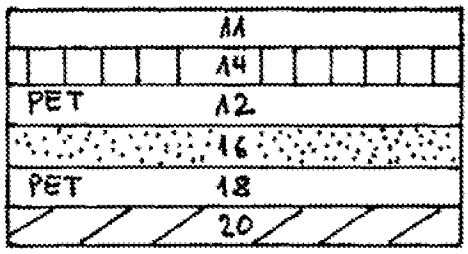


Fig. 2

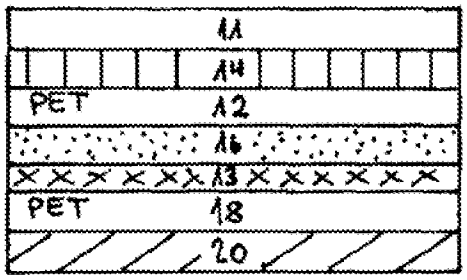


Fig. 3

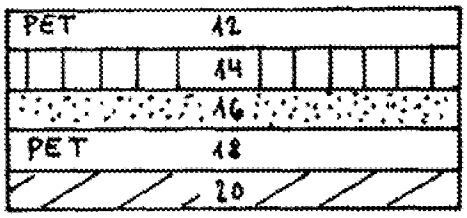


Fig. 4

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Europäisches Patentamt

EUROPÄISCHER RECHERCHENBERICHT

Nummer der Anmeldung
EP 04 40 5247

EINSCHLÄGIGE DOKUMENTE

Kategorie	Kennzeichnung des Dokuments mit Angabe, soweit erforderlich, der maßgeblichen Teile	Betrifft Anspruch	KLASSIFIKATION DER ANMELDUNG (Int.Cl.7)
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Der vorliegende Recherchenbericht wurde für alle Patentansprüche erstellt

Recherchenort	Abschlußdatum der Recherche	Prüfer
München	17. September 2004	Kanetakis, I

KATEGORIE DER GENANNTEN DOKUMENTE

X : von besonderer Bedeutung allein betrachtet
Y : von besonderer Bedeutung in Verbindung mit einer anderen Veröffentlichung derselben Kategorie
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ANHANG ZUM EUROPÄISCHEN RECHERCHENBERICHT ÜBER DIE EUROPÄISCHE PATENTANMELDUNG NR. EP 04 40 5247

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten europäischen Recherchenbericht angeführten Patentdokumente angegeben.
Die Angaben über die Familienmitglieder entsprechen dem Stand der Datei des Europäischen Patentamts am
Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

17-09-2004

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Für nähere Einzelheiten zu diesem Anhang : siehe Amtsblatt des Europäischen Patentamts, Nr.12/82

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Espacenet

Bibliographic data: EP1588845 (A1) — 2005-10-26

Packaging film

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Classification: - **international:** ***B32B27/36; B32B7/12; B65D65/02; B65D65/40; B65D77/20;*** (IPC1-7): B32B27/36; B65D65/02; B65D65/40; B65D77/20

- **cooperative:** **B32B27/08 (US); B32B27/36 (EP, US); B32B7/12 (EP, US);** B32B2307/306 (US); B32B2307/31 (US); B32B2307/412 (US); B32B2553/00 (US)

Application number: EP20040405247 20040422 Global Dossier

Priority number(s): EP20040405247 20040422

Also published as: EP1588845 (B1) AT424994 (T) ES2320656 (T3) PL1588845 (T3)

Abstract of EP1588845 (A1)

The packaging foil for closing containers by hot-seal processes comprises two polyethylene terephthalate (PET) foils (12, 18) which are joined to one another by a glue layer (16), and are provided respectively with printing (14) and a hot-seal layer (20).

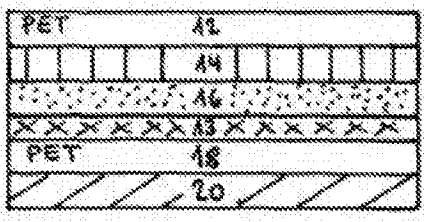


Fig. 1

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DESCRIPTION EP1588845

[0001]

The invention relates to a packaging film for sealing containers by heat sealing.

[0002]

Known cover foils for sealing containers made of plastic by heat-sealing the foil against the edge of the container are coated or uncoated aluminum foils as well as various composite foils of paper and PET or paper / aluminum laminates.

[0003]

The invention has for its object to provide a packaging film of the type mentioned, which have a lower weight compared to conventional packaging films and thus lead to a lower eco-tax.

Furthermore, the packaging film should enable high-gloss printing, guarantee the protection of the printing and prevent the film from sticking to the sealing tools. In addition, the packaging film should be able to be used on high-speed FFS machines.

[0004]

To achieve the object according to the invention, a packaging film with two films of polyethylene terephthalate (PET) connected to one another via an adhesive layer, wherein a first PET film has a printing and the second PET film has a heat-sealable layer.

[0005]

A preferred heat seal layer is based on a copolymer based on copolymers of ethylene and vinyl acetate, vinyl acetate and vinyl chloride or based on acrylate.

The heat seal layer may also be an extrusion coating.

[0006]

The imprinted side of the first PET film can lie on the outside of the film and in this case is provided with a heat-resistant protective lacquer layer. The second PET film can be metallized, white or transparent. The first PET film with the printing can also be metallised, white or transparent.

[0007]

The metallization is here the preferred method to give the PET film and thus the packaging film barrier properties and thus to prevent the passage of liquids, gases, vapors, water vapor, flavors or odors. A [illegible]

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the first or second PET film in a thickness of about 10 nm to about 2 µm, for example, by sputtering or by vacuum deposition.

[0008]

The printing of the first PET film can be made with all known printing methods, such. As book, offset, flexo, screen, Helio and copper gravure, but also laser printing, inkjet, electrophotographic and magnetographic printing processes. The choice of which printing process to use depends on the desired print quality, on the respective technical conditions and the number of copies. The second protective lacquer layer protects the printed image when it lies on the outer side of the film.

[0009]

The imprinted side of the first PET film can also lie on the inside of the film, in which case the first PET film is transparent.

[0010]

The second PET film with the heat seal layer may be transparent, white or metallized.

[0011]

Preferably, the adhesive layer contains a lubricant suitable for cutting blade, z.

As a powder of TiO 2, in particular a powder with TiO 2 particles having an average particle size of about 1 to 10 microns.

[0012]

Further advantages, features and details of the invention will become apparent from the following description of preferred embodiments and from the drawing; 1 schematically shows in FIG. 1 the layer structure of a first embodiment of a packaging film in high-gloss quality; 2 shows the layer structure of a second embodiment of a packaging film for use as a starting material; 3 shows the layer structure of a third embodiment of a packaging film with high barrier quality; 4 shows the layer structure of an alternative embodiment of a packaging film with high barrier quality.

[0013]

A packaging film 10 in high-gloss quality, according to FIG. 1, has the following structure. 12: first PET film, transparent, 6 to 36 µm, z.

B. 12 microns 14: printing, z.

By helio or flexography 16: adhesive layer made by applying solvent-dissolved adhesive, 2.0 to 4.0 g / m 2, or adhesive without solvent, 1.3 to 2.0 g / m 2 2>, or aqueous adhesive solution, 0.9 to 6.0 g / m 2, with an addition of TiO 2 13: Barrier layer of aluminum, vapor-deposited in vacuum on the PET film 12, 10 nm to 2 µm, 18. second PET film, transparent, 6 to 36 µm, z. B. 12 microns 20: heat-sealable layer, prepared by applying a coating based on copolymers of ethylene and vinyl acetate, 4.0 ± 0.5 g / m <2>, or copolymers of vinyl acetate and vinyl chloride, 4, 0 ± 0, 5 g / m 2, or acrylate, 4, 0 ± 0.5 g / m 2

[0014]

In the production of the packaging film 10, the transparent first PET film 12 serving as the print carrier is first printed. The second transparent PET film 18 is provided on one side with the heat seal layer 20 and on the other side with the barrier layer 13 and above with the adhesive layer 16 with an addition of TiO 2 powder. Subsequently, the provided with the heat seal layer 20 transparent metallized second PET film 18, 13 bonded via the adhesive layer 16 with the printed transparent first PET film 12, 14 to the packaging film 10.

[0015]

The unprinted side of the transparent first PET film 12 forms the later outer side, and the heat seal layer 20 applied to the transparent metallized second PET film 18, 13 forms the inside of a container closed with the packaging film 10.

[0016]

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A packaging film 10 for use as a starting material has, according to FIG. 2, the following structure: 11: Protective varnish layer of a nitrocellulose lacquer, 1.1 ± 0.5 g / m 2: printing, eg.

By helio or flexography 12: first PET film, white, 6 to 36 µm, e.g. B. 12 microns 16: adhesive layer prepared by application of solvent-dissolved adhesive, 2.0 to 4.0 g / m 2, or adhesive without solvent, 1.3 to 2.0 g / m 2, or aqueous adhesive solution, 0.9 to 6.0 g / m 2, with an addition of TiO 2 18: second PET film, transparent, 6 to 36 µm, e.g. B. 12 microns 20: heat-sealable layer, prepared by applying a coating based on copolymers of ethylene and vinyl acetate, 4.0 ± 0.5 g / m <2>, or copolymers of vinyl acetate and vinyl chloride, 4, 0 ± 0, 5 g / m 2, or acrylate, 4, 0 ± 0.5 g / m 2

[0017]

The second embodiment of a packaging film 10 shown in FIG. 2 differs from the embodiment shown in FIG. 1 in that the printed first PET film 12, 14 is white and the printing 14 with the protective lacquer layer 11 is the later outside, which is on the transparent second PET film 12 applied heat seal layer 20 forms the inside of a closed container with the packaging film 10 container. In this embodiment, a protective varnish layer is required for the printing. To produce the packaging film 10, the printed white first PET film 12, 14 is adhered against the transparent second PET film 18 provided with the adhesive layer 16 in the same manner as in the above-described embodiment of FIG.

[0018]

According to FIG. 3, a packaging film 10 with a high barrier quality has the following structure: 11: Protective lacquer layer of a nitrocellulose lacquer, 1.1 ± 0.5 g / m 2: printing, eg. By helio or flexography 12: first PET film, transparent, 6 to 36 µm, e.g. B. 12 microns 16: adhesive layer prepared by application of solvent-dissolved adhesive, 2.0 to 4.0 g / m 2, or adhesive without solvent, 1.3 to 2.0 g / m 2, or aqueous adhesive solution, 0.9 to 6.0 g / m 2, with an addition of TiO 2 13: Barrier layer of aluminum vapor-deposited on the PET film 12 in a vacuum, 10 nm to 2 µm, 18: second PET film. Film, transparent, 6 to 36 µm, z. B. 12 microns 20: heat-sealable layer, prepared by applying a coating based on copolymers of ethylene and vinyl acetate, 4.0 ± 0.5 g / m <2>, or copolymers of vinyl acetate and vinyl chloride, 4, 0 ± 0, 5 g / m 2, or acrylate, 4, 0 ± 0.5 g / m 2

[0019]

In the production of the packaging film 10, the transparent first PET film 12 serving as the print carrier is first printed. Subsequently, the order of the protective layer 11 takes place. The transparent second PET film 18 is provided on one side with the heat seal layer 20 and on the other side with the barrier layer 13 and above with the adhesive layer 16. Subsequently, the provided with the heat seal layer 20 transparent metallized second PET film 18 via the adhesive layer 16 with the printed and provided with the protective layer 11 white PET film 12, 14 bonded to the packaging film 10.

[0020]

According to FIG. 4, an alternative packaging film 10 has the following structure: 12: first PET film, transparent, 6 to 36 µm, z. B. 12 microns 14: printing, z. By helio or flexography 16: adhesive layer made by applying solvent-dissolved adhesive, 2.0 to 4.0 g / m 2, or adhesive without solvent, 1.3 to 2.0 g / m 2 2>, or aqueous adhesive solution, 0.9 to 6.0 g / m 2, with an addition of TiO 2 18: second PET film, white, 6 to 36 microns, z. B. 12 microns 20: heat-sealable layer, prepared by applying a coating based on copolymers of ethylene and vinyl acetate, 4.0 ± 0.5 g / m <2>, or copolymers of vinyl acetate and vinyl chloride, 4, 0 ± 0, 5 g / m 2, or acrylate, 4, 0 ± 0.5 g / m 2

[0021]

The alternative packaging film 10 shown in FIG. 4 differs from the embodiment shown in FIG. 3 in that the printed first PET film 12, 14 is transparent and the white second PET film 18 is on one side with the heat-sealing layer 20 and the other side is provided with the adhesive layer 16.

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CLAIMS EP1588845

1.

A packaging film for sealing containers by means of heat-sealing, characterized by two films of polyethylene terephthalate (PET) connected to one another via an adhesive layer (16), wherein a first PET film (12) has a print (14) and the second PET film (18) has a Heissiegelschicht (20).

2.

Packaging film according to Claim 1, characterized in that the side of the first PET film (12) provided with the printing (14) lies on the outside of the film and is provided with a heat-resistant protective lacquer layer (11).

3.

Packaging film according to claim 2, characterized in that the first PET film (12) with the printing (14) is transparent, white or metallised.

4.

Packaging film according to claim 2, characterized in that the second PET film (18) is transparent, white or metallised.

5.

Packaging film according to Claim 1, characterized in that the side of the first PET film (12) provided with the printing (14) lies on the inside of the film and the first PET film (12) is transparent.

6.

Packaging film according to claim 5, characterized in that the second PET film (18) with the heat seal layer (20) is transparent, white or metallized.

7.

Packaging film according to one of claims 1 to 6, characterized in that the adhesive layer (16) contains a lubricant suitable for cutting blade.

8.

Packaging film according to claim 7, characterized in that the lubricant is titanium [illegible]

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9.

Packaging film according to one of claims 1 to 8, characterized in that the heat seal layer (20) is an extrusion layer.

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(54) Cartridge for use with a device for preparing an infused beverage

(57) The invention relates to a cartridge containing infusible substance for use in a device for preparing infused beverage. The cartridge comprises a bottom part provided with a filter adapted to let liquid pass through and a top part (38) provided with an opening. Side walls are joining the bottom and top parts. The bottom part forms a recess arranged toward the inside of the cartridge, the surface of the recess comprising an actuating surface for actuating a mechanism of the device.

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Description

Field of the invention

[0001] The invention relates to a cartridge containing infusible substances for use in a device for preparing infused beverage. The cartridge comprises a bottom part provided with a filter adapted to let liquid pass through and a top part provided with an opening. Side walls are joining the bottom and top parts.

[0002] As a matter of example, the infusible substance can alternatively be tea leaves, various different herbs and spices, herbal tea, flower petals, leaves, seeds, roots, powder, coffee or other materials capable of being infused.

Description of prior art

[0003] Such cartridges are known in the art.

[0004] For instance, Japanese patent application JP 2001-120436 discloses a tea preparation device comprising an infusion tank which can be filled with hot water, and a holder which can communicate with the tank through a communication aperture. A passage communicates with the tank for pouring out the infused tea. A cartridge is used and contains tea leaves. The cartridge has a removable top seal.

[0005] In use, the tea leaf cartridge is inserted in the holder. The cartridge top seal is removed when the holder is inserted in the device. The opened cartridge in the holder is moved under the tank. Then, while the opening is turned toward the interior of the tank, the tea leaves contained in the cartridge are able to move and float freely into the infusion tank, once water is introduced in the tank and holder. The infusion then takes place. A stirring mechanism comprising a rod partially immerged in the infusion tank can be operated to stir the water while infusing.

[0006] A drainage hole in the holder and the passage are arranged to discharge the infused tea from the tank to a discharge container and the cartridge is entirely or partially formed as a filter. That is, once the infusion is completed, the tank is emptied and the tea leaves return in the cartridge and settle there.

[0007] The disclosed device provides easy setting up and preparation of a liquid infusion in a traditional way during which tea leaves are allowed to float freely in the liquid, and it also provides easy handling of the used infusible substance, such as tea leaves, in the cartridge itself forming a filter.

[0008] The device disclosed in the prior art presents a security problem in the sense that a user may start the device, even if no cartridge has been introduced in the machine. If it is the case, the infusion container must be emptied. Either the infusion container needs to be removed and emptied manually. Or water needs to be evacuated in the discharge container. In that case, infusion already contained in the discharge container is diluted, impairing its taste and flavour.

[0009] Another drawback of the device comes from the fact that the liquid infusion is stored in a discharge container. Because the liquid infusion stored in the discharge container continues infusing, its taste and flavour is impaired.

[0010] It has also been found that not all tea leaves contained in the cartridge are able to move and float freely into the infusion tank. Some leaves tend to remain within the cartridge preventing the liquid from infusing properly.

Summary of the invention

[0011] It is an object of the invention to provide a cartridge for infusible substances for use in a device for preparing infused beverage according to which the functioning of the device is safe.

[0012] To this end, the bottom part of the cartridge forms a recess arranged toward the inside of the cartridge, the surface of the recess comprising an actuating surface for actuating a mechanism of the device.

[0013] The cartridge is mainly but not necessarily adapted for being slot in the following device for preparing infusion beverage. The device includes an infusion container for containing liquid and comprising an opening to allow liquid to flow out of the container. The device includes a receptacle defining a cavity for receiving a cartridge containing infusible substances. The infusion container and the receptacle are operable in relation to each other to be arranged in a position wherein the infusion container and the cavity communicate through the opening. Infusible substances contained in the cartridge are immersed once liquid is poured into the infusion container to the cavity; the infusible substances are able to move and float freely in the infusion chamber. The infusion takes place.

[0014] The device further comprises an openable and closable passage communicating with the cavity. Once the infusion is completed, the passage is opened and the infused liquid flows from the infusion container to the passage through the cavity and the filter of the cartridge. The infused liquid may be poured directly in a cup.

If no cartridge is inserted in the device, at least one mechanism of the device is not actuated. The functioning of the device may be paused or stopped. Such security mechanism prevents a user to operate the device when no cartridge is introduced.

[0015] It is an object of the invention to provide a cartridge for infusible substances for use in a device for preparing infused beverage according to which all substances contained in the cartridge are efficiently used for preparing the beverage.

[0016] To this end, the recess is provided with at least an opening for letting gas pass through.

[0017] The device for preparing infused beverage may comprise an injecting means for injecting gas in the infusion container. The recess of the cartridge constitutes a space or compartment into which the means for inject-

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ing gas, such as an injection nozzle, may be located. The injecting means injects gas in the cartridge through the opening of the recess.

[0018] In use, when the cartridge is slot within a device for preparing infused beverage, the injection means is inserted in the recess. Gas is injected in the infusion container through the cartridge. The infusible substances are pushed out of the cartridge to float within the infusion container. The infusible substances are prevented from remaining within the cartridge while the infusion takes place.

[0019] Preferably, the opening is disposed in the recess to face an opening of the injection means through which gas is injected. The size of the opening of the recess is substantially equal to that of the injection opening. The gas is properly injected in the infusion container through the cartridge. It avoids gas pockets from developing in the device around the cartridge; such gas pockets could damage the cartridge or create tensions within the device.

[0020] It is known to the skilled person that tea infusion takes place in three stages. Firstly the caffeine contained in tea leaves is diffused to the liquid, then all aromas giving the infusion its flavour and finally the tea leaves release their acid tannins. If the tea leaves are infused too long or at a wrong temperature, the effect of either the first or the second stage are annihilated, the tannins destroying either the caffeine or the aromas.

[0021] The infusion takes place around the tea leaves and water located immediately around the leaves becomes rapidly saturated. The infusion process slows down and the three stages of the process are partially or not properly performed; Water around the leaves is highly concentrated in caffeine and poorly concentrated in aromas.

[0022] To prevent such an effect, gas may be injected within the infusion container through the cartridge, while the infusion takes place to stir the liquid and homogenize the infusion.

[0023] The introduction of oxygen further provides the advantage of improving the quality of infused tea beverage. It is known that water when heated up looses oxygen, which has effect on the taste of the tea. Oxygenating the liquid while it infuses restores a normal oxygen concentration to water and ensures a high quality taste for the infused tea.

[0024] In another embodiment, openings for letting a gas pass through, arranged in the side walls of the cartridge may be used as well. Openings in the recess have been found to be more efficient for pushing infusible substances out of the cartridge and for uniformly agitating and oxygenating the liquid during infusion.

[0025] In one embodiment, the recess has a substantially cylindrical or frustroconical form defining recess side walls and a recess top. The at least one opening of the recess is provided through the recess side walls, or/and through the recess top.

[0026] Preferably, the recess has a circular bottom section with a diameter comprised between 2 and 15 millimetres, or more particularly between 2 and 6 millimetres. Such a range consists of an optimal compromise between a recess large enough to provide sufficient space for the injection means of the device and a recess small enough to provide a sufficient surface for liquid to flow out of the cartridge through the filter.

[0027] It is an object of the invention to provide a cartridge for infusible substances for use in a device for preparing infused beverage which may be firmly maintain in the device. To this end, the top part of the cartridge comprises a lip surrounding the opening of the top part. The lip may be trapped in a gripping mechanism of the device. It is important that the cartridge is correctly and firmly hold within the cavity to insure that the actuating surface of the recess the injection means of the device remains located in the recess of the cartridge. Failure to do so could result to gas pockets developing and creating unnecessary tensions within the device.

Preferably, the cartridge has a substantially cylindrical or frustroconical form. A cartridge of such a form can easily be slot and steadily maintained within a cavity of a complementary shape. Cartridge of different forms, for instance semi-spherical forms may not fit so properly within a cavity and may slide in one direction or another.

A cartridge of such a form is also easy to manufacture, whether the cartridge is made of plastic material and moulded or made of metal and stamped by application of a mould, form, or die. Preferably, the angle formed by the side walls and the bottom part is comprised between 90 degrees and 100 degrees, or more particularly between 93 degrees and 97 degrees.

[0028] In one embodiment, the filter consists of a sheet made of aluminium perforated. Food contact approved aluminium may be used. Alternatively, the inner surface of the filter may be covered with a food contact approved coating layer able to resist to temperatures at least up to 100°C during several minutes. Alternatively, the filter consists of at least a sheet made of wool or of any natural or synthetic material adapted to infusion and filtering.

[0029] Preferably the cartridge is made of aluminium. Food contact approved aluminium may be used. Alternatively, the inner surface of the cartridge may be covered with a food contact approved coating layer able to resist to temperatures at least up to 100°C during several minutes.

[0030] It is a further object of the invention to provide a cartridge containing infusible substances which may be easily manipulated. To this end, the opening of the top part of the cartridge is provided with and closed by a sheet, arranged toward the outside of the cartridge with respect of the opening.

The opening of the cartridge is closed, its content being securely enclosed. The sheet may be automatically cut in the device for preparing infused beverage.

[0031] It is a further object of the invention to provide a cartridge which contents is protected from humidity, air and light. To this end, the bottom part of the cartridge is

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further provided with and closed by a removable sheet, arranged toward the outside of the cartridge with respect of the filter.

The content of the cartridge is protected from air, light and humidity. The removable sheet may be removed manually just before the cartridge is to be used; the flavour and aromas of the infusible substance may be preserved until then. The infusible substance may also be vacuum-packed.

[0032] According to one embodiment, the cartridge includes automatic readable means adapted to be read or detect by a detecting or reading means. The readable means may comprise and/or inform on preparation parameters for indicating how to infuse the infusible substance of the cartridge at best.

[0033] Advantageously, the preparation parameters may consist of the infusion temperature and/or the infusion duration and/or when the gas injection takes place, how long it lasts, etc.

Short description of the drawings

[0034] These and further aspects of the invention will be explained in greater detail by way of example only and with reference to the accompanying drawings in which:

Fig.1a shows a perspective top view of a cartridge according to one embodiment for use in a device for preparing infused beverages;

Fig.1b shows a perspective bottom view of a cartridge according to one embodiment;

Fig.1c shows a perspective side view of a cartridge according to one embodiment;

Fig.1d shows a perspective side view of the bottom part of a cartridge according to one embodiment;

Fig.1e shows a cross-sectional side view of the cartridge according to one embodiment;

Fig.1f shows a cross-sectional side view of the cartridge according to another embodiment;

Fig.2 shows a perspective front view of a device for preparing infused beverages in which a cartridge according to the invention is used;

Fig.3 shows a detailed perspective side view of the device;

Fig.4 shows a perspective front view of the inside of the device for preparing infused beverages;

Fig.5 shows a perspective back view of the inside of the device for preparing infused;

Fig.6 shows a perspective side view of the inside of the device for preparing infused;

Fig.7 shows a perspective top view of a receptacle of the device for receiving cartridge;

Fig.8 shows a schematic section of a receptacle of another device for receiving a cartridge;

Fig.9a-e shows a mechanism for opening a cartridge located inside the device.

Fig.10a-c shows a mechanism for withdrawing a cartridge according to the invention from a device for preparing infused beverage;

[0035] The figures are not drawn to scale. Generally, identical components are denoted by the same reference numerals in the figures.

Detailed description of preferred embodiments

[0036] A cartridge 12 according to the invention is explained in respect with **figures 1a, 1b, 1c, 1d, 1e.** The cartridge 12 comprises a bottom part 42 provided with a filter 44 adapted to let liquid pass through, a top part 38 provided with an opening 35 and side walls 45 joining the bottom and top parts 42, 38 . It defines an inner volume 40 to contain infusible substances 12. The volume 40 is calculated so to receive enough infusible substances 12 for preparing a standard cup of infused beverages. Infusible substances when soaked tend to swell. The volume 40 is also calculated to contain all the swollen infusible substances once infused.

[0037] The cartridge 12 is cone-shaped, truncated at the level of the bottom part 42. In one embodiment, the section of the top and bottom part 38, 42 is circular or oval. The section of the opening 35 is circular or oval. The angle α formed by the side walls 45 and the bottom part 42 is between 90 and 100 degrees and preferably comprised between 93 and 97 degrees. In another embodiment, the cartridge 12 is cylindrical.

[0038] Such a shape allows creating an inner volume 40 big enough to contain enough infusible substances for preparing a standard cup of beverage. Such shape allows the cartridge 12 to be steadily inserted within the cavity 16. It is also perfectly suitable to ensure a perfect fit between the cartridge 12 and the cavity 16.

[0039] The side walls of the cartridge 12 are air- and waterproof and opaque to be impermeable to water, air and light. The cartridge 12 is preferably made of aluminium. Food contact approved aluminium may be used. Alternatively, the inner surface of the cartridge 12 may be covered with a food contact approved coating layer able to resist to temperatures at least up to 100°C during several minutes.

[0040] Preferably, the filter 44 is as part of the cartridge 12 and consists of a perforated sheet made of aluminium. Food contact approved aluminium may be used. Alternatively, the inner surface of the filter 44 may be covered with a food contact approved coating layer.

[0041] Alternatively, the filter 44 may consist of at least a sheet made of wool or of any natural or synthetic material adapted to infusion and filtering. It is attached in a conventional manner to the bottom part 42, preferably on the inner walls of the cartridge 12.

[0042] The top part 38 comprises a lip 39 surrounding the opening 35 at least partly. The lip 39 rests upon the

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rim of the receptacle 10. The opening 35 is closed and covered by a sheet 50 (not represented) arranged towards the outside of the cartridge. Preferably the sheet 50 is made of aluminium and is heat-sealed to the lip 39 in a conventional manner.

[0043] In one embodiment, the top part 38 may be covered by a filter (not represented) arranged towards the outside of the cartridge 12. The sheet 50 covers the filter. The filter consists of an extensible or deformable sheet made of wool or of any natural or synthetic material adapted to infusion and filtering. When a cartridge 12 comprising such filter is immersed in water, the filter spreads in water out of the cartridge; the filter creates a space in water where infusible substances 14 contained in the cartridge 12 are able to float. Such filter prevents from infusible substances 14 from scattering everywhere in the infusion container 6 in particular and in the device in general.

[0044] The bottom part 42 is recovered by a removable sheet 36, arranged towards the outside of the cartridge 12 with respect to the filter 44. The removable sheet 36 may be heat-sealed or glued to the cartridge 12 in a conventional manner. It is made of aluminium or of any other food approved material. The removable sheet 36 comprises a prehension means (not shown), so a user can grasp and remove it from the cartridge 12.

[0045] The sheets 36 and 50 hermetically close and vacuum-pack the inner contents 40 of the cartridge 12. The infusible substances 12 are protected from air and humidity. Both sheets 36, 50 and cartridge 12 are preferably made of an opaque material to protect its contents 14 for light as well.

[0046] The cartridge 12 may comprise marks or any automatic readable means comprising or indicating infusion parameters. The marks or readable means may be located either on the outside surface of the side walls 45 or on the lip 39 or on the sheet 50.

[0047] In one embodiment, the bottom part 42 includes a recess 46 arranged toward the inside of the cartridge 12. The recess 46 is frustrocone-shaped, the larger section of the recess 46 being at the level of the bottom part 42. The larger section of the recess 46 has a diameter comprised between 2 and 15 millimetres, or more particularly between 2 and 6 millimetres.

[0048] The recess 46 comprises openings 48 for letting gas pass through. In one embodiment, four openings 48 are located on the side walls 52 and one on the top part 54 of the recess 46. As a matter of example, the four openings 48 on the side walls are arranged symmetrically with respect of the axis of the recess 48.

[0049] **Figure 2** shows a perspective front view of a device for preparing infused beverages which uses cartridges according to the invention.

[0050] The device 2 comprises a removal reservoir 66 containing liquid and two infusion containers 6 for containing liquid 4. The infusion container 6 is designed to simultaneously contain air and enough water for a normal cup of beverage. Alternatively, the infusion container 6 is designed to contain several cups of beverage.

[0051] The infusion container 6 is disposed on a platform 68 connected to the device 2 via a supporting arm 69. A removable holding cap 70 is clipped on top of the container 6. An opening (not represented) is located on top of the container 6 and is closed by the holding cap 70. A pair of arc-shaped arms 71 connects the holding cap 70 to the platform 68. The container 6 is securely held between the platform 68 and the holding cap 70. The supporting arm 69, the holding cap 70, the pair of arms 71 enclose various conduits for gas and liquid to flow between the infusion container 6 and other internal elements of the device 2.

[0052] An opening 8 (not represented) is provided at the bottom of the container 6 to allow liquid 4 to flow out of the container 6.

[0053] The platform 68 comprises a spout 19, through which the infused beverage is poured out of the device 2. The spout 19 opens above a cup support 64. The cup support 64 is adapted to hold a cup or any similar container to collect the infused beverage poured from the spout 19 directly.

[0054] The device 2 may be adapted to prepare simultaneously one, two or more infused beverages at a time. The device 2 comprises a corresponding number of infusion containers 6 and accompanying parts.

[0055] Referring now to **figure 3**, the platform 68 comprises a receptacle 10 for receiving a cartridge 12 containing infusible substances 14. In this particular embodiment, the receptacle 10 consists of a drawer. The drawer 10 is operable between at least a first position and a second position. The drawer 10 slides from a closed position in the platform 68 to an opened position out of the platform 68. The drawer comprises a cavity 16 into which a cartridge 12 (not represented) containing infusible substances may be inserted. The drawer 10 may slide either automatically or manually. When the drawer 10 is closed in the platform 68, the cavity 16 of the drawer 10 communicates with the bottom opening 8 of the infusion container 6, so that the infusion container 6 and the cavity 16 form an infusion chamber.

[0056] The cavity 16 of the drawer 10 is connected to a passage 18 (not represented) located in the platform 68. An actuated valve allows closing and opening the passage 18. When the passage 18 is opened, liquid flows out of the infusion container 6 through the cavity 16 to the passage 18. When the passage 18 is closed, the infusion chamber formed by the cavity 16 and the infusion container 6 is closed. The passage 18 is connected to the spout 19 as well as to a conduit for waste water described below through actuated valves. Liquid flowing into the passage may be directed either to the conduit for waste water or to the spout 19.

[0057] The device 2 for preparing infused beverage is now described in respect with **figures 4, 5, 6**.

[0058] The device 2 comprises a support 72 for the reservoir 66. The support 72 comprises an opening where the valve-cap of the reservoir 66 is plugged, giving

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access to the water contained in the reservoir 66.

[0059] The support 72 is connected to a conduit 65a, creating a flow path for water from the reservoir 66. The conduit 65a is connected to a series of conduits 65b, via a system of actuated valves, to transfer water to respective infusion container 6. The conduit 65b is located within one of the pair of arms 71. A sprinkler 63 with several outlets 61 is disposed at one extremity of the conduit 65b. The sprinkler 63 is located within the holding cap 70 and is plugged into an opening located at the top of the infusion container 6. A pump 67 is used for the transfer of water from the conduit 65a to the conduits 65b.

[0060] The device 2 further comprises a heating chamber 59 to heat water. The device comprises an air or gas inlet pipe 28 located within the arm 69 and the platform 68. The gas inlet pipe 28 is adapted to deliver pressurised gas. The pump 67 is used for ejecting pressurised gas into one of the inlet pipe extremity. The pump 67 is actuated to control the pressure of the gas at the inlet.

[0061] The device 2 further comprises a conduit 23 to collect waste water from the infusion container 6. The conduit 23, connected at one extremity to a waste container (not represented) located within the device 2 and travels within the arm 69 and the platform 68. Its other extremity is located within the platform 68.

[0062] The device 2 further comprises a conduit 24 to collect used cartridges from the receptacle 10. The conduit 24 is located in the arm 70 and opens above the waste container.

[0063] In a manner known, the device 2 further comprises a sensor to detect the presence of a cup on one of the cup holder 64, a set of control knobs 3 for the user to operate the device 2, an operating means comprising a processing means to electronically control and operate all mechanisms of the device 2. The processing means includes a printed circuitry 25 and memory to store data for use by the processing means.

[0064] The receptacle 10 of the device 2 is now explained in respect with **figure 7**.

[0065] The receptacle 10 consist of a drawer comprising a front panel 105, a tray 107. The drawer 10 slides along two side panels 104a and 104b located inside the platform 68. A multiple runner mechanism 101,102,103 is disposed on the top edge of both side panels 104a, 104b.

[0066] The tray 107, removably linked to the side panels 104a, 104b through the multiple runner mechanism, slides along the side panels 103, 104. A mechanism located in the platform 68 is provided to rise up and support the tray 107 away from the side panels 104a, 104b. The tray 107 is formed by two panels 107a and 107b hinged to each other through a hinge 108. The hinge 108 is disposed perpendicular to the sliding direction of the tray 107.

[0067] The tray 107 comprises a cavity 16 adapted to receive a cartridge 12. The cavity 16 comprises partial side walls 110 connected to the first panel 107a of the tray 107 and a partial bottom part 111 connected to the side walls 110. The partial side walls and bottom part 110 and 111 are disposed towards the front panel 105 and underneath the first panel 107a only. The partial side walls 110 and the partial bottom part 111 form a partial cone or cylinder, truncated at the level of the bottom part 111. The dimensions of said partial cone are slightly larger than those of the cartridge 12, so that the cartridge 12 perfectly fit into the cavity 16.

[0068] A protruding nozzle 112, preferably cylindrical or frustrocone-shaped, is located on the bottom part 111 towards the inside of the cavity 16. The dimensions of protruding nozzle 112 are such that the recess 46 of a cartridge 12 inserted in the cavity 16 perfectly fits the protruding nozzle 112. The protruding nozzle 112 comprises openings 113 injecting gas towards the inside of the cavity 12. The openings 113 are disposed in the protruding nozzle 112 in such way that the openings in the recess of a cartridge 12 inserted in the cavity face the injection opening 113. In one embodiment, four openings 113 are located on the side walls of the nozzle 112 and one on its top part 54.

[0069] The protruding nozzle 112 is connected to a conduit 29 (not represented) located within the bottom part 111 of the cavity 16. Alternatively, the conduit 29 may be located on the surface of the bottom part 111 either towards the inside of the cavity 16 or the outside of the cavity 16. The conduit 29 is connected to gas inlet pipe 28.

[0070] In another embodiment, the protruding nozzle 112 may be located on the partial side walls 110 of the cavity 16.

[0071] A recess 109 is disposed on the top surface of the tray 107 around the top edges of cavity 16. The section of the recess 109 is slightly larger than that of the lip 39 of cartridges 12 so that the lip 39 of a cartridge 12 received in the cavity 16 perfectly slots the recess 109.

[0072] A mechanism to automatically open a cartridge according to the invention, while the drawer 10 slides into the platform 68, is now described with reference to **figures 9a to 9e**.

[0073] The device 2 comprises a pair of parallel arc-shaped bars 33 between which a flat blade 31 is attached. The blade 31 is fixely attached tangent to the cylindrical surface formed between the arc-shaped bars 33. The blade 31 is preferably a semi-circular or semi-oval blade, its straight side being connected to the arc-shaped bars 33 through rods 31a. The small and long diameters of the blade 31 are slightly smaller than these of the opening 35 of the cartridge 12.

[0074] The arc-shaped bars 33 rotate around the infusion container 6 through the platform 68 and within the pair of arc-shaped arms 71. The sliding movement of the drawer 10 in the platform 68 is linked to the movement of the arc-shaped bars 33.

[0075] The arc-shaped bars 33 are positioned tangent to the sliding direction of the receptacle 10. The arc-shaped bars 33 are located tangent to the tray 107 of the drawer 10 and on each side of the top part of cavity 16

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of the drawer 10.

[0076] Figure 9a shows the position of the blade 31 in relation to the cartridge 12, when the drawer 10 starts sliding into the platform 68. The arc-shaped bars 33 rotate and soon the lip 29 of the cartridge 12 is trapped between the arc-shaped bars 33 and the recess 109 of the tray 107. The edge of the blade 31 touches and pierces the first sheet 50 inside the opening 35 of the cartridge 12 close to the opening edge. Figure 9b to 9d shows the position of the blade 31 in relation to the cartridge 12, while the drawer 10 keeps on sliding into the platform 68. The arc-shaped bars 33 keep on rotating; the blade 31 follows a circular movement in and out of the cartridge 12 cutting the sheet 50 close to the edge of the opening 35. It is important that the cartridge 12 is remained blocked in the cavity 12 between the arc-shaped bars 33 and the recess 109 of the tray 107, so that the blade 31 may perform a proper and efficient cut of the sheet 50.

[0077] Figure 9e shows the position of the blade 31 in relation to the cartridge 12, when the drawer 10 reaches its final position in the platform 68. When the blade 31 moves out of the cartridge 12, it pushes away of the cartridge 12 the part of the sheet 31 it just cut out. The cut out part remains partially attached to the sheet 31. The whole opening 35 is accessible.

[0078] In another embodiment, the cut out part of the sheet 50 is entirely separated from the sheet 50 and is dragged away by the blade 31, when the blade 31 moves out of the cartridge 12. The cut out part falls by gravity onto the ejection chute 106 and is collected within the second waste container 78.

[0079] The blade 31 could be of any shape adapted to the section of the opening 35. The dimensions of the blade need to be smaller than these of the opening 35, to allow the blade 31 to slide in and out of the cartridge 12 via the opening 35 and to cut the sheet 50.

[0080] Once the drawer 10 is closed within the platform 68 and once the top sheet 50 of the cartridge 12 has been cut out, the tray 107 is raised up away from the side panels 104a, 104b. The lip 39 of the cartridge 12 located in the recess 109 of the tray 107 is brought into contact with the bottom opening 8 of the infusion container 6. A gasket 84 disposed on the edge of the bottom opening 8 ensures a hermetic connection between the infusion container 6 and the lip 39. The cartridge 12 is firmly maintained blocked within the cavity 16.

[0081] The dimensions of the opening 8 of the infusion container 6 are equal or larger than those of the section of the cavity 16 on the tray 107 to surround the opening 35 of the cartridge 12. The dimensions of the opening 8 of the infusion container 6 are smaller than those of the section of the recess 109 of the tray 107.

[0082] The device 2 further comprises a movable snapping insert 81 (not represented) located in the platform 68. The movement of the insert 81 is controlled by the operating means of the device 2. The insert 81 is operated to be brought to contact with the cavity 16 of the tray 107. The insert 81 is adapted to fit exactly together with the edge of the side walls 110 of the cavity 16 and with the bottom part 111 of the cavity 16. The insert 81 is also adapted to fit together with the bottom surface of the tray 107. A gasket 83 (not represented) may be disposed on each part of the insert 81 adapted to contact the cavity 16. The insert 81 is connected to the passage 18.

Once the drawer 10 is closed within the platform 68 and once the tray 107 has been brought to contact with the bottom opening 8 of the infusion container 6, the insert 81 is operated and brought to contact with the cavity 16, so the cavity 6 and the insert 81 fit exactly together. The gasket 83 ensures that the surfaces of contact between the insert 81, the cavity 16 and the tray 107 are hermetic. The infusion container 6, the tray 107 the cavity 16 and the insert 81 form a hermetic infusion chamber closed by the passage 18.

[0083] A mechanism for ejecting from the cavity of the drawer 10 a cartridge according to the invention is now explained in respect with **figures 10a to 10c.**

[0084] Figure 10a shows the drawer 10 closed within the platform 68 in the first position. Fig. 10b shows the tray 107 in an intermediate position, sliding on the side panel 104a, 104b towards the inside of the platform 68. Fig. 10c shows the tray 107 sliding further towards the inside of the platform 68 in a third position, where the tray 107 folds up around the hinge 108. The second panel 107b slides out of the third runner 103 and falls on the ejection chute 106. The cavity 16 comprising partial side walls 110 along the first panel 107a only, the cartridge 12 is not held within the cavity 16 anymore. The cartridge 12 is released from the cavity 16; it falls on the ejection chute 106 and slides down toward the ejection conduit 24 in the arm 69. While the cartridge 12 falls down on the ejection chute 106, the cut out part of the sheet 50 is pushed back toward the sheet 50 and partially closes the opening 35 of the cartridge 12. The infusible substances 14 are maintained within the cartridge 12.

[0085] The ejection mechanism to withdrawn the cartridge 12 allows to eject the cartridge smoothly. It prevents the infused substances 14 contained in the cartridge 12 from falling out of the cartridge 12. Some infused substances may still fall out of the cartridge 12 when it is dropped onto the ejection chute 108. They are collected on the ejection chute 108 in any case.

[0086] The drawer 10 and the insert 81 of another device in which the cartridge 12 according to the invention is used are now explained in respect with **figure 8**. A mechanism for detecting a cartridge 12 in the cavity 16 is also presented.

[0087] The drawer 10 comprises a tray 107 with a cavity 16 adapted to receive a cartridge 12. The cavity 16 comprises side walls 110 connected to the tray 107. The side walls 110 form a partial cone or cylinder, truncated at the bottom part. When a cartridge 12 is inserted in the cavity 16b, it is maintained in the cavity 16 through its lip resting upon the upper surface of tray 107; the side walls 45 of the cartridge 12 lay upon the side walls 110 of the

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cavity 16.

[0088] The device 2 further comprises a movable insert 81 located in the platform 68. The movement of the insert 81 is controlled by the operating means of the device 2. The insert 81 is operated to be brought to contact with the cavity of the tray 107. The insert 81 adapted to fit exactly together with the edges 114 of the side walls 110 of the cavity 16. A gasket 83 may be disposed either on the insert 81 or on the edges 114 of the side walls 110 to ensure a hermetic contact between the cavity 16 and the insert 81. The insert 81 is connected to the passage 18.

[0089] A protruding nozzle 112, preferably cylindrical or frustrocone-shaped, is located in the insert 81 towards the inside of the cavity 16. The protruding nozzle 112, provided with openings 113 for the ejection of gas, is connected to a conduit 29 located within the insert 81; the conduit 29 is connected to the inlet pipe 28.

[0090] The insert 81 comprises a detector to detect whether a cartridge 12 is slot in the cavity 16 or not. The detector comprises an actuating push-button 82, located around the protruding nozzle 112 and connected to the circuitry 25 of the device 2. The push-button 82 is able to slide up and down along the protruding nozzle 112. When pushed down, it actuates part of the functioning of the device 2. The push-button 82 is cone-shaped, truncated at the level of its top part. The diameter of the bottom section (at the level of the bottom part 42) of the recess 46 of a cartridge 12 is larger than that of the top section of the push-button 82. Preferably the angle of the cone of the recess 46 is substantially identical to that of the cone of the push-button 82.

[0091] Once the drawer 10 is closed within the platform 68 and once the tray 107 has been brought to contact with the bottom opening 8 of the infusion container 6, the insert 81 is operated to be brought to contact with the cavity 16, so the cavity 6 and the insert 81 fit exactly together. The cartridge 12 is firmly maintained in the cavity 16, its lip 39 between grasped between the upper surface of the tray 107 and the edge of the opening 8 of the infusion container 6. While the insert 81 is raised up, the protruding nozzle 112 and the push-button 82 move into the recess 46 of the cartridge 12. The outside side surface of the push-button 82 is brought into contact with the side surface of the recess 46.

[0092] The push-button 82 keeps on moving into the recess 46, sliding along the surface of the recess 46 until the push-button 82 is blocked between the surface of the recess 46 and the protruding nozzle 112. As the insert 81 keeps on sliding up, the push-button 82 is pressed down by the surface of the recess 46 of the cartridge 12; the push-button creates a new connection in the circuitry 25 for the actuation of a process in the device 2. Once the insert 81 is brought into contact to the edges 114 of the cavity 16, the protruding nozzle 112 is located inside the recess 46 of the cartridge 12, so that the openings 113 of the protruding nozzle 112 face the openings 48 of the recess 46.

[0093] Once the cartridge 12 is removed from the cavity 12 whether automatically or manually, it releases the push-button 82. Similarly, the release of the push-button 82 may control at least a step in the functioning of the device 2.

[0094] A cartridge according to another embodiment of the invention is now explained with respect to **figure 7F**. The bottom part 42 of the cartridge comprises a recess 46a towards the inside of the cartridge 12. The recess 46a consists of a first truncated cone 46a1, its larger section being at the level of the bottom part 42 of the cartridge 12 and of a second truncated cone or cylinder 46a2 "stacked" upon the first cone 46a1. The intersection between the first and second cone 46a1 and 46a2 constitutes an actuating surface 46b. The recess 46a2 comprises openings 48 for letting gas pass through.

[0095] The diameter of the bottom section of the recess 46a1 is larger than that of the top section of the push-button 82. Preferably the angle of the cone of the recess 46a1 is substantially identical to that of the cone of the push-button 82.

[0096] In use, when the insert 81 is raised up, the protruding nozzle 112 and the push-button 82 of the insert 81 move into the recess 46a1 of the cartridge 12. The outside side surface of the push-button 82 is brought into contact with the side surface of the recess 46a1. The push-button 82 slides along the surface of the recess 46a1 until being blocked by the actuating surface 46b. As the insert 81 keeps on sliding up, the push-button 82 is pressed down by the surface 46b; the push-button creates a new connection in the circuitry 25 for the actuation of a process in the device 2. Once the insert 81 is brought into contact to the edges 114 of the cavity 16, the protruding nozzle 112 is located inside the recess 46a2 of the cartridge 12, so that the openings 113 of the protruding nozzle 112 face the openings 48 of the recess 46a.

[0097] While various embodiments of the present invention have been described in detail, it is apparent that modifications and adaptations of those embodiments will occur to those skilled in the art. It is to be expressly understood, however, that such modifications and adaptations are within the scope of the present invention.

Claims

1. Cartridge (12) for containing infusible substance (14) for use in a device for preparing an infused beverage (4), including:

   a bottom part (42) provided with a filter (44) adapted to let liquid (4) pass through;
   a top part (38) provided with an opening (35);
   side walls (45) joining the bottom (42) and top (38) parts;

   characterized in that
   the bottom part (42) forms a recess (46) arranged

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toward the inside of the cartridge (12), the surface of the recess (46) comprising an actuating surface for actuating a mechanism of the device.

2. Cartridge (12) according to claim 1, wherein the recess (46) is provided with at least an opening (48) for letting gas pass through.

3. Cartridge (12) according to any of the preceding claims, wherein the opening of the top part (38) is provided with and closed by a extendable and/or deformable filter arranged toward the outside of the cartridge (12) with respect of the opening (35).

4. Cartridge (12) according to any of the preceding claims, wherein the opening of the top part (38) is provided with and closed by a sheet (36), arranged toward the outside of the cartridge (12) with respect of the opening (35).

5. Cartridge (12) according to any of the preceding claims, wherein the bottom part (42) is provided with and closed by a removable sheet (50), arranged toward the outside of the cartridge (12) with respect of the filter (44).

6. Cartridge (12) according to any of the preceding claims, wherein the recess (46) has a substantially cylindrical or frustroconical form defining recess side walls (52) and a recess top (54), and wherein the at least one opening (48) of the recess (46) is provided through the recess side walls (52), or/and through the recess top (54).

7. Cartridge (12) according to claim 6, wherein the bottom section of the recess (46) has a diameter comprised between 2 and 15 millimetres, or more particularly between 2 and 6 millimetres.

8. Cartridge (12) according to anyone of the preceding claims, having a substantially cylindrical or frustroconical form.

9. Cartridge (12) according to claim 8, wherein the angle (α) formed by the side walls (45) and the bottom part is comprised between 90 degrees and 100 degrees, or more particularly between 93 degrees and 97 degrees.

10. Cartridge (12) according to any of the claims 1 to 9, made of food contact approved aluminium or aluminium having its inner surface covered with a food contact approved coating and able to resist to temperatures at least up to 100°C during several minutes.

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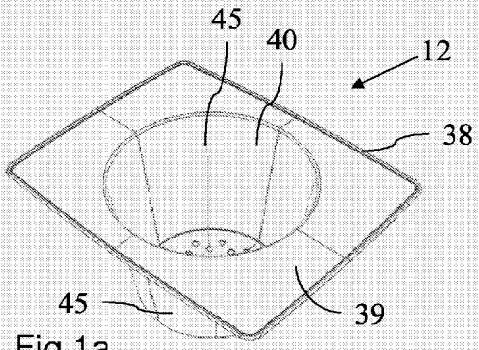


Fig 1a

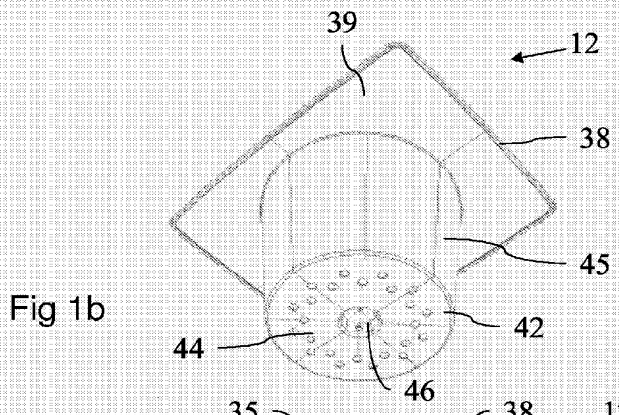


Fig 1b

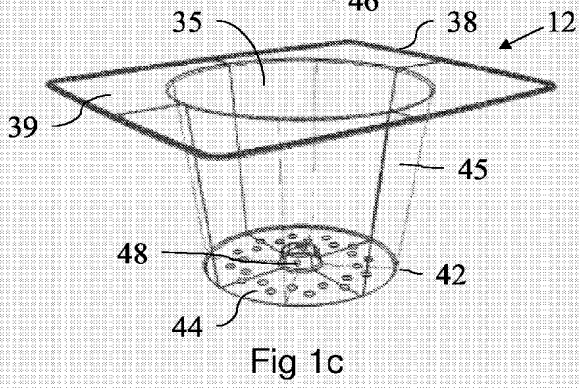


Fig 1c

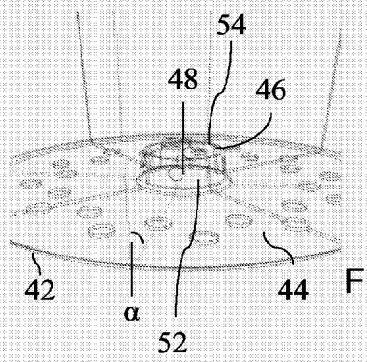


Fig 1d

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FIG 1E

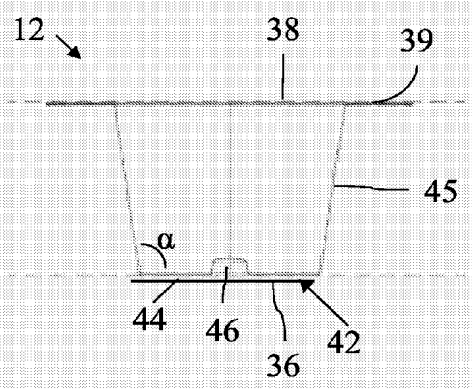
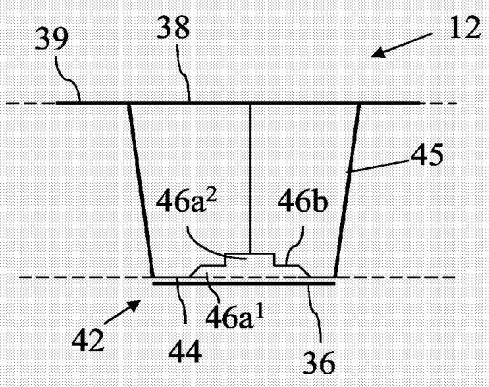
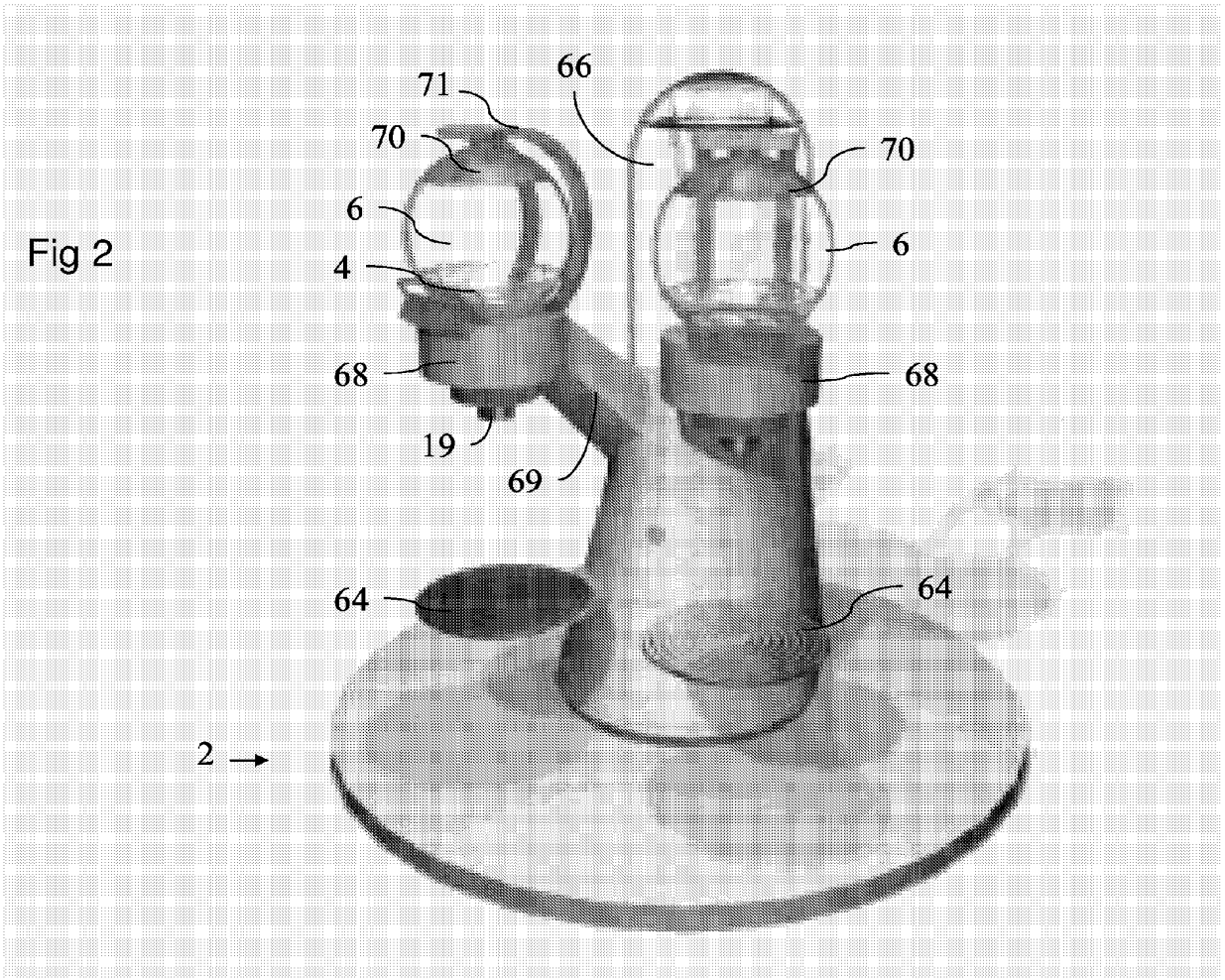


FIG 1F



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Fig 2



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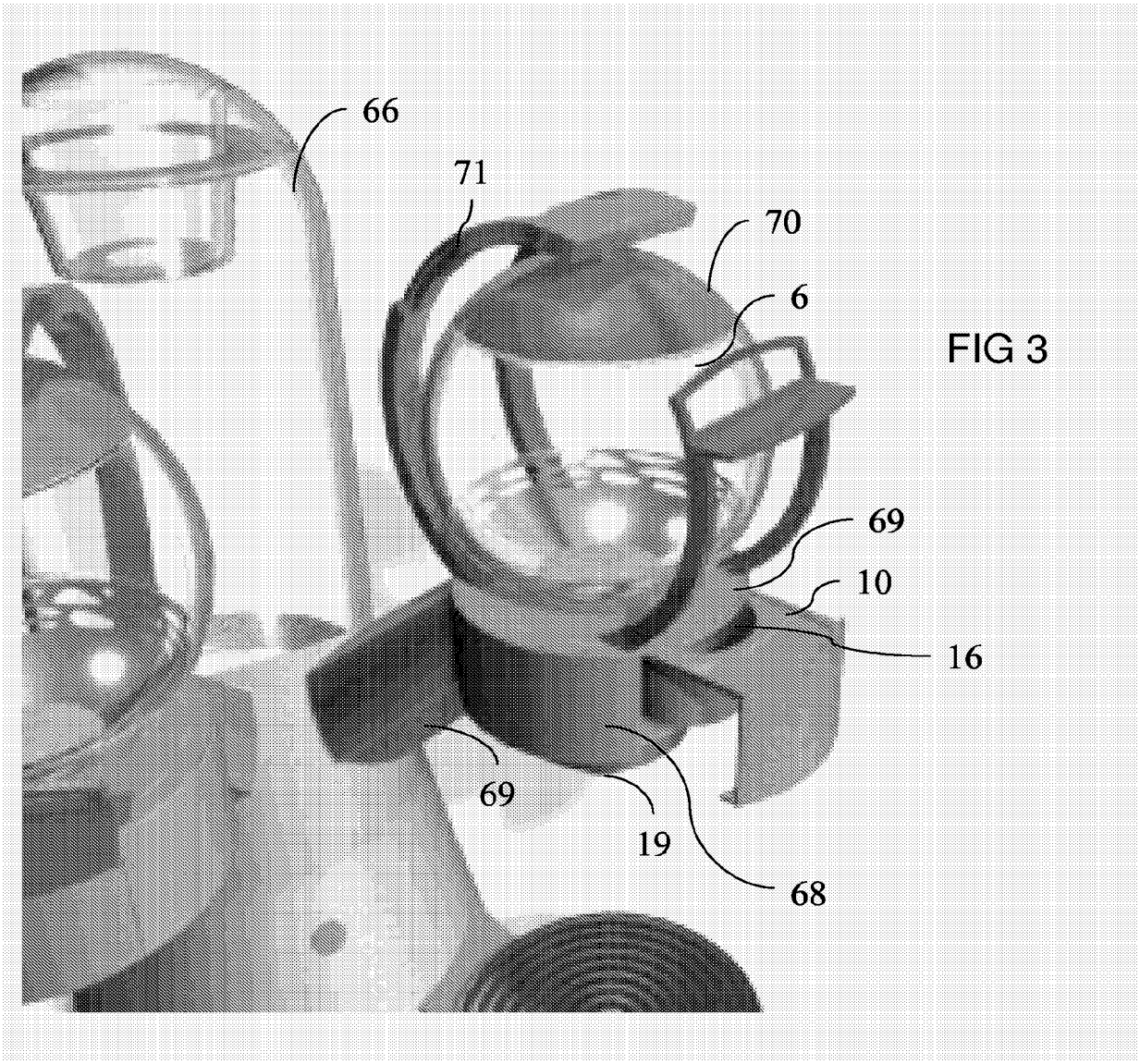
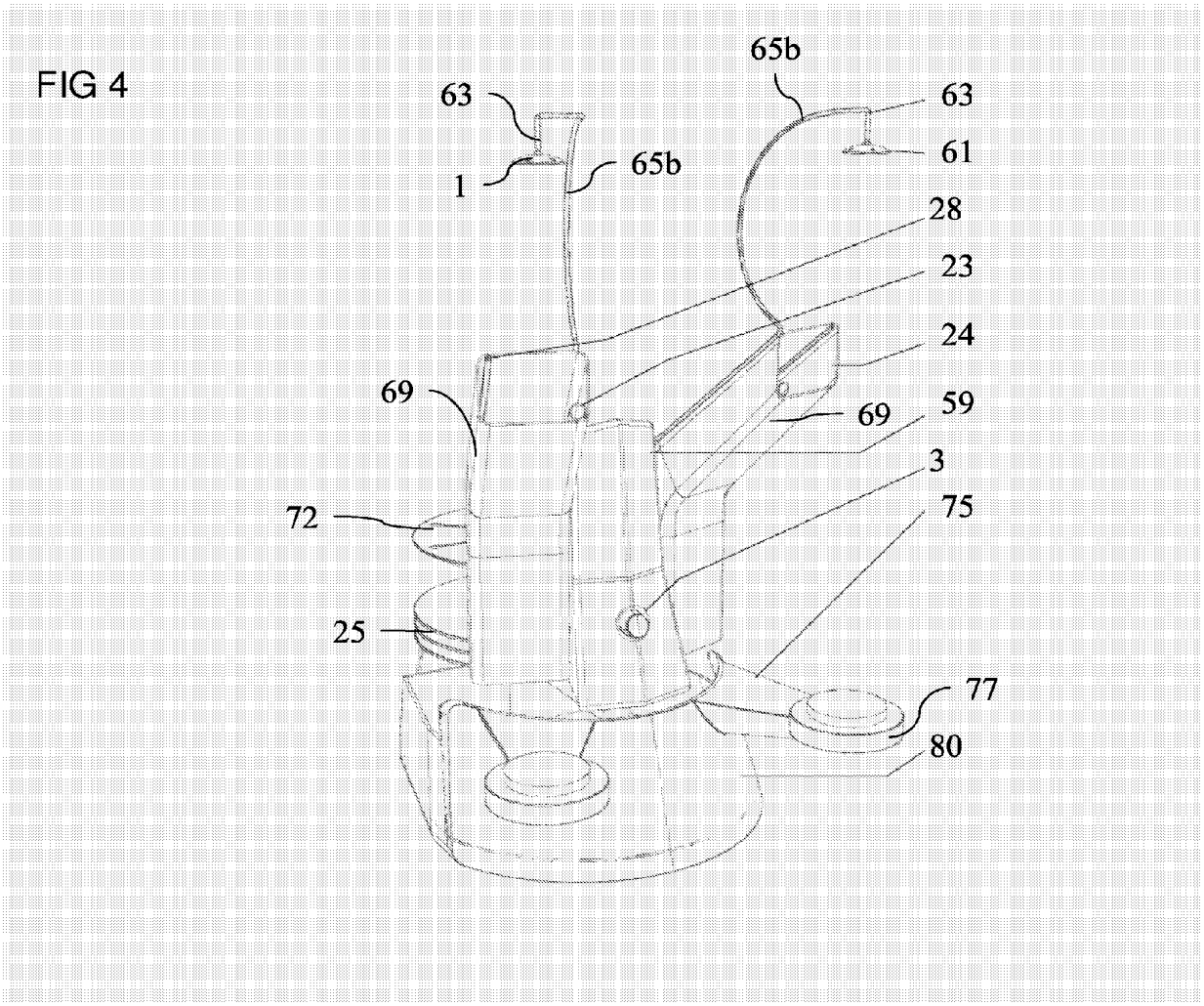


FIG 3

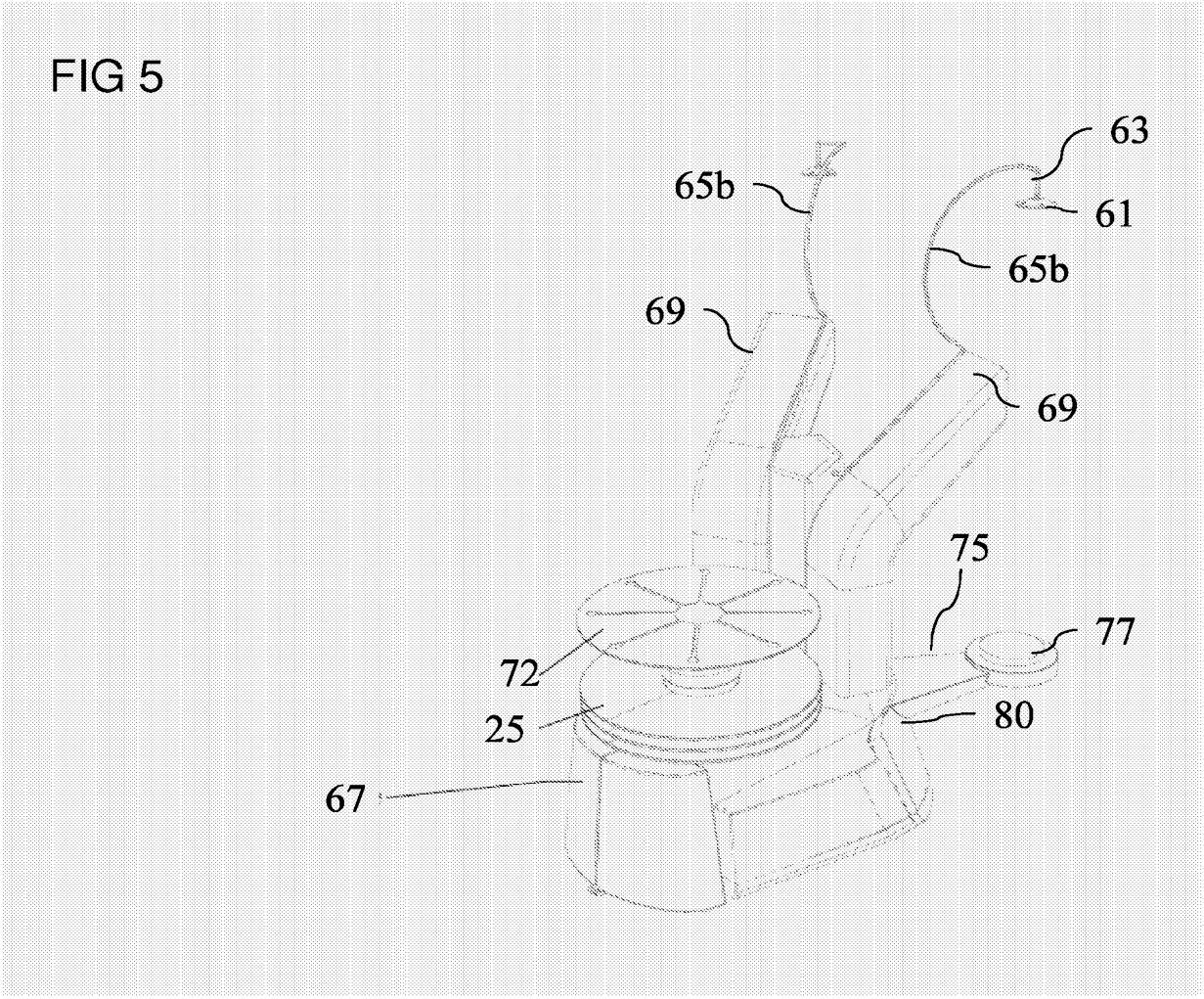
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FIG 4



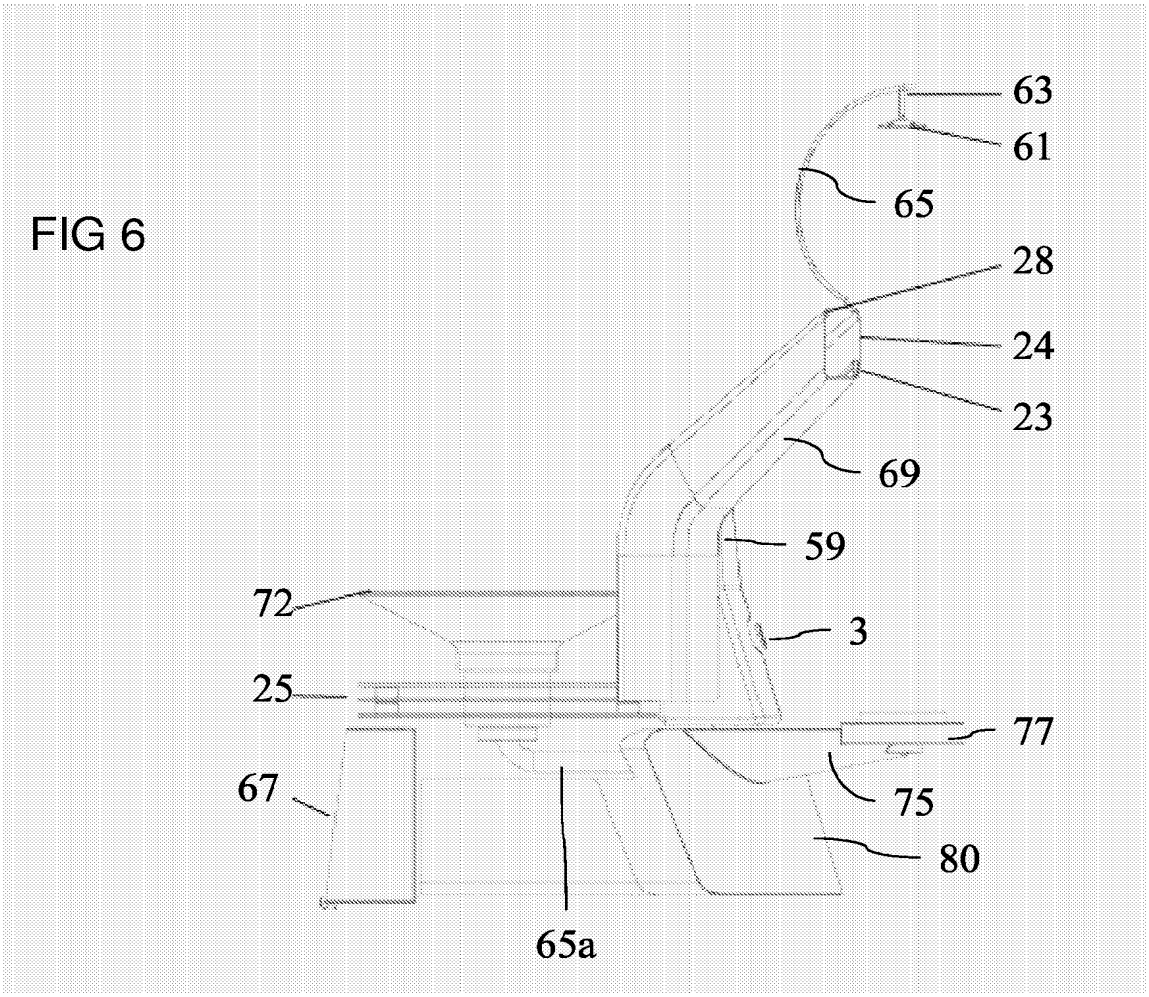
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FIG 5



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FIG 6



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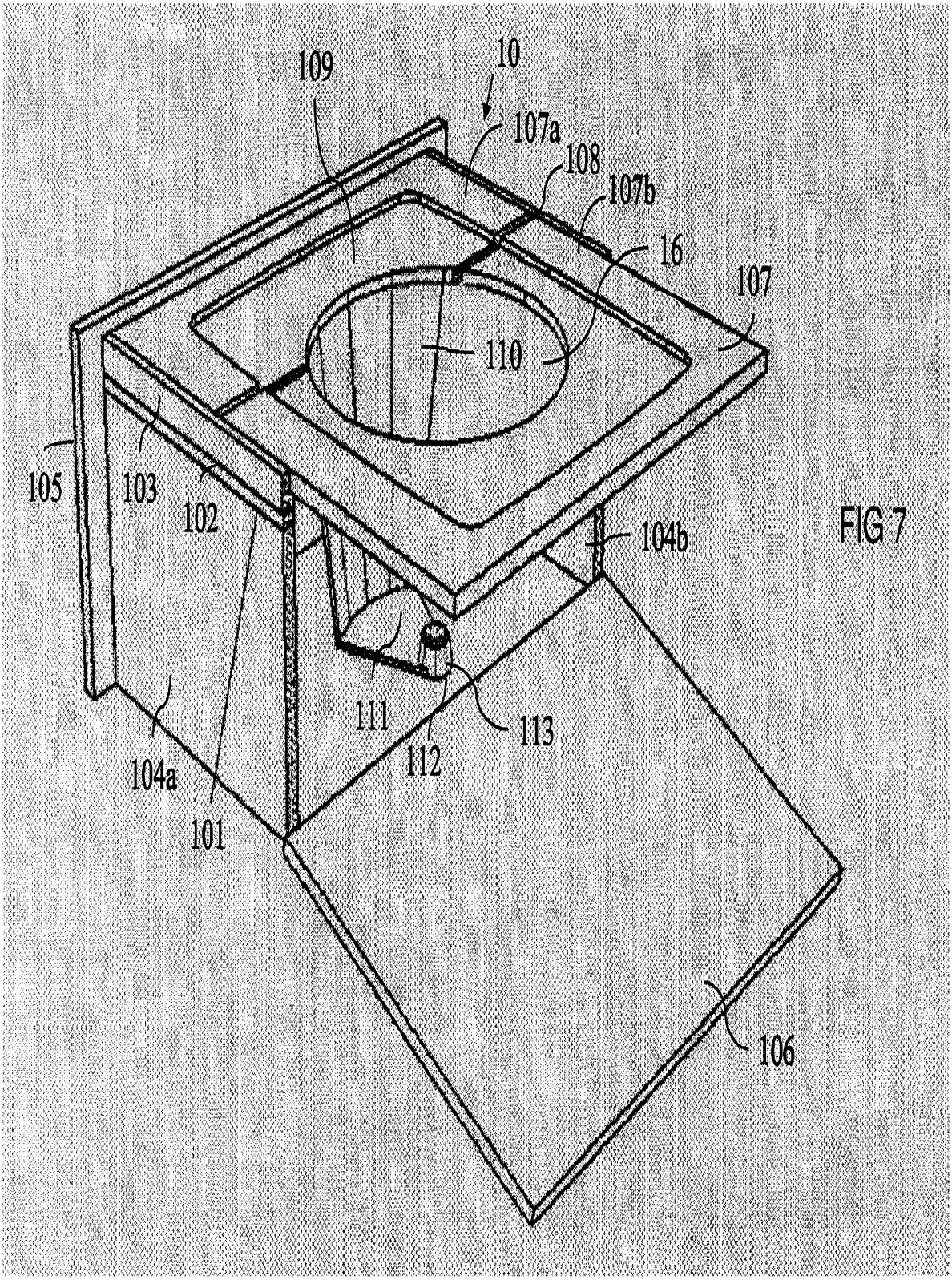

109
10
107a
108
107b
16
107
110
105
103
102
104b
111
113
112
104a
101
106

FIG 7

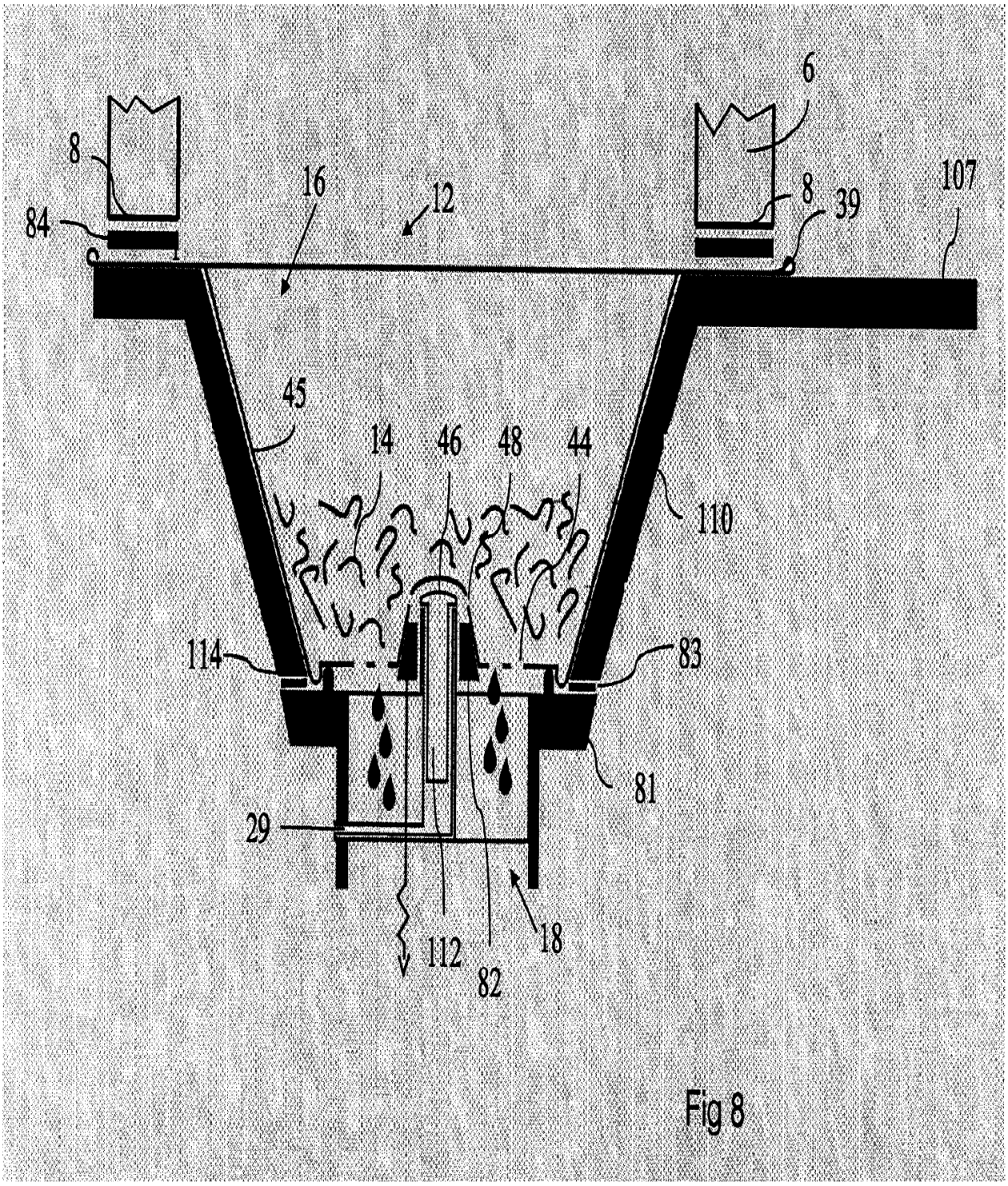
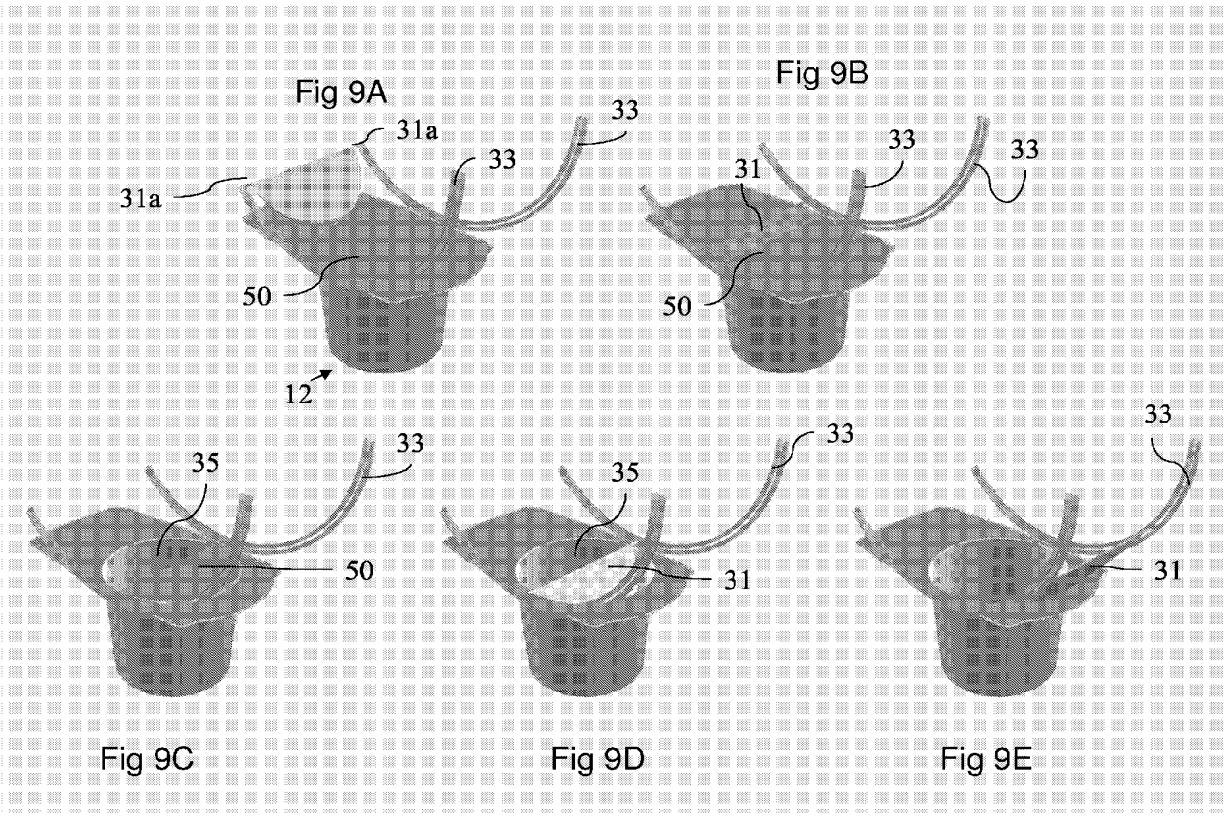


Fig 8



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FIG 10A

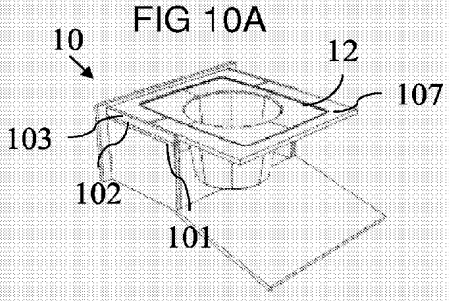
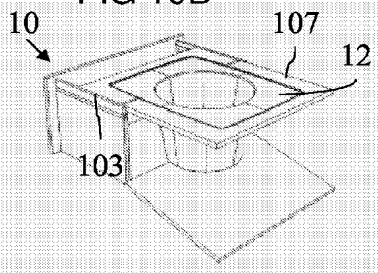


FIG 10B



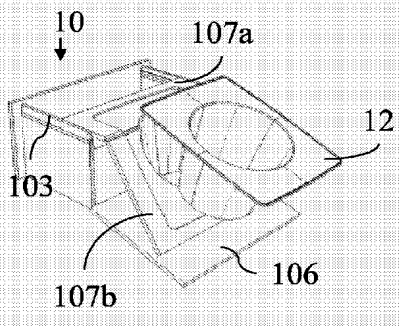


FIG 10C

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European Patent Office

EUROPEAN SEARCH REPORT

Application Number
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			TECHNICAL FIELDS SEARCHED (IPC)
			B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	13 February 2006	Cazacu, C

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 05 10 9370

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(54) Monodose capsule containing a preparation for beverages

(57) A capsule (1) containing ground coffee (C) for making a beverage in an extraction process envisaging the passing through the capsule itself by an extraction fluid, said capsule (1) comprising a cylindrical main body (2, 3, 4) defining an internal housing (10) for receiving the coffee (C), said main body (2, 3, 4) having, in correspondence of the lateral wall (4) of the housing (10), a plurality of longitudinal grooves (5) arranged in the direction of the fluid flow in the extraction process and apt to convey such a fluid through the capsule (1) itself (Figure 8).

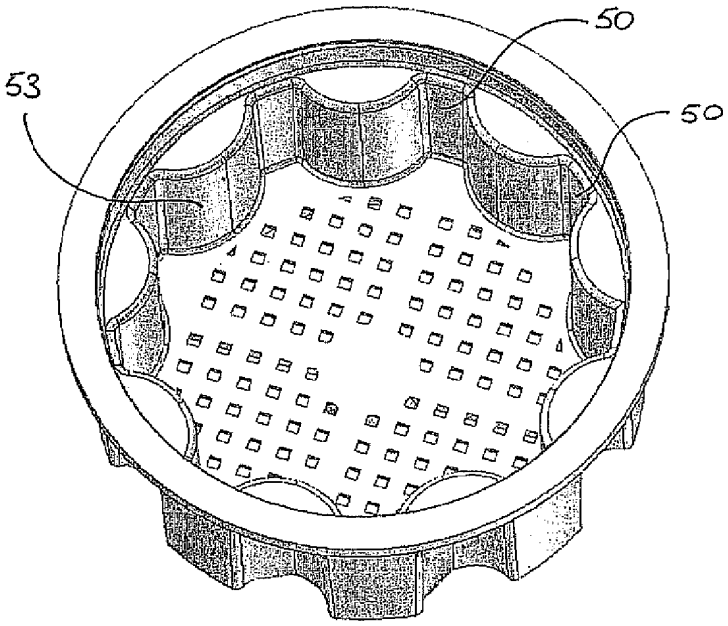


FIG. 8

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Description

[0001] The present invention refers to a single-dose capsule containing a substantially granular infusion for making beverages such as coffee and the like.

[0002] In the last few years, machines for making hot beverages such as coffee, tea, chocolate and the like from a pre-metered single-dose and single-use capsule containing a preparation in the form of a substantially granular infusion have become ever more widespread. Said machines envisage the capsule to be passed through by a liquid, typically water and/or milk, at a certain temperature and pressure, thereby obtaining, out of the capsule, the end beverage. This making process is commonly indicated as 'extraction' of the beverage from the capsule.

[0003] Said machines are typically used at offices and workplaces in general.

[0004] As to the capsules, several embodiments thereof do exist, both in terms of shape and materials used. However, one of the problems still unsolved of the capsules at issue is represented by the optimization of brewing conditions, and in particular by the option of obtaining, through the capsule, a liquid flow even and optimal from the standpoint of the resulting beverage. For this purpose, a drawback often found is represented by the fact that the liquid passes through privileged portions of the capsule only, instead of throughout the internal housing receiving the infusion. Moreover, the significant parameters of the flow passing through the capsule, like, e.g., speed and direction, may variously be affected by its shape, often even in a way and to an extent *a priori* unforeseeable, to the detriment of the quality of the end beverage and of the repeatability of its features, e.g. in terms of taste and density.

[0005] Hence, the technical problem set and solved by the present invention is to provide a capsule for making beverages of the above-mentioned type, allowing to overcome the drawbacks hereto-mentioned with reference to the known art.

[0006] Such a problem is solved by a capsule according to claim 1.

[0007] Preferred features of the present invention are present in the dependent claims thereof.

[0008] In the present context, the term 'capsule' is used in its most general meaning, encompassing also pods or cartridges and generally any member containing a preparation for beverages in the form of infusion.

[0009] The present invention provides several relevant advantages. The main advantage lies in the fact that the internal grooves of the capsule attain optimal flow conditions for the liquid passing through the capsule itself, to the advantage of the quality and repeatability of the end beverage and also of the correct operation of the associated machines, which are not subject to unforeseeably variable flow conditions.

[0010] Other advantages, features and the operation steps of the present invention will be made apparent in the following detailed description of some embodiments thereof, given by way of example and not for limitative purposes. Reference will be made to the figures of the annexed drawings, wherein:

- Figure 1 shows a front perspective view of a capsule according to an embodiment of the invention;
- Figure 2 shows a bottom perspective view of the capsule of Figure 1;
- Figure 3 shows a side perspective view from the top of the capsule of Figure 1;
- Figure 4 shows a side perspective view from the bottom of the capsule of Figure 1;
- Figure 5 shows a front perspective view from the top of a top portion of the capsule of Figure 1;
- Figure 6 shows a front perspective view from the bottom of said top portion of the capsule of Figure 1;
- Figure 7 shows a sectional view of the capsule of Figure 1 without the powder infusion contained therein; and
- Figure 8 shows a top perspective view of the capsule of Figure 1, in which the infusion contained therein and said top portion have been removed.

[0011] Referring to the above-introduced figures, a single-dose and single-use capsule containing a substantially granular infusion and apt to be used for making a beverage by extraction process is generally denoted by 1. In the present embodiment the capsule 1 contains ground coffee (not depicted for simplicity's sake).

[0012] The capsule 1 comprises a main body of substantially cylindrical overall geometry, which has just a longitudinal axis of symmetry A. In particular, the main body is comprised of a top face 2 and a bottom face 3 having a substantially circular contour, and of a lateral surface or skirt 4 bearing a plurality of grooves that will be detailed hereinafter. Such top and bottom faces 2 and 3 and lateral skirt 4 define an internal housing 10 of the capsule 1, better seen in Figures 7 and 8, receiving the ground coffee.

[0013] In correspondence of the top face 2 the main body of the capsule 1 has a peripheral edge 6 having annular contour, projecting with respect to the lateral surface 4, a raised band 7, it also of annular contour and arranged internally with respect to the peripheral edge 6, and a substantially disc-like central portion 8. The latter is of rigid or semirigid type, and preferably made of plastics material. The extraction fluid fed by the machine for making the beverage should just enter the internal housing 10 through said disc-like portion 8, which to this end bears small holes 81 distributed according to a substan-

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tially radial symmetry.

[0014] According to a variant embodiment, said top face may be made, e.g., of a porous filtering material, e.g. a paper material peripherally adhered on a peripheral edge having an annular contour alike the hereto-introduced one. In that case, no raised band is envisaged.

[0015] Depending on the specific implementation, the disc-like portion 8 may be piece-formed with the remainder of the main body, and in particular with said edges 6 and 7, or made integral to the peripheral edge 6, e.g. by heat-resistant glues, as already mentioned hereto.

[0016] In correspondence of the bottom face 3, better seen in Figure 2, the main body of the capsule 1 provides a central disc-like portion 9 through which the beverage has to come out, and that therefore may have an embodiment alike that of the above-described top portion 8.

[0017] The disc-like portion 9 is inscribed in a projecting annular band 11, indented with respect to the lateral skirt 4.

[0018] As mentioned above, in correspondence of its lateral skirt 4 the main body of the capsule 1 has a plurality of concave external grooves 5, identical the one to the other and equally distributed over the entire lateral extension of the skirt 4 itself according to an axial geometry. The grooves 5 develop in a direction substantially parallel to axis A of the capsule 1 and are partitioned by external longitudinal ribs 52. Also the latter are identical the one to the other, equally distributed over the entire lateral extension of the skirt 4, and develop along a direction substantially parallel to the axis A of the capsule 1.

[0019] As it is better seen in Figure 8, the external ribs 52 are internally hollow, thereby producing in correspondence of the housing 10 a plurality of grooves or internal notches 50 of the capsule itself. Therefore, said internal notches 50 define longitudinal portions of the housing 10 inside which part of the ground coffee is received. The presence and arrangement of the notches 50 allows, as already mentioned above, optimal conveyance of the extraction fluid within the capsule 1, preventing stagnation, allowing to accurately control and foresee the properties of said flow and generally to optimize the extraction process.

[0020] Said advantages are enhanced by the specific configuration selected for the internal 50 and external 5 grooves, providing each of the former ones to have a development with a substantially plane bottom wall, wherein adjacent external grooves 5 have a convex internal contour substantially arched, following in particular substantially an arc of circumference. Internally to the housing 10 the external grooves 5 define a plurality of corresponding bulges 53.

[0021] Moreover, in the present embodiment the external 5 and internal 50 grooves involve only the bottom portion of the lateral skirt 5. Above the portion involved by said grooves, the lateral skirt 4 has instead a portion 41 with a substantially annular and continuous development 41 adjacent to the top face 2. Such a contrivance further improves the above-disclosed abilities to convey the extraction fluid.

[0022] It will be understood that the invention further refers to an automatic machine for making coffee or other beverages, comprising a housing specifically shaped for receiving the hereto-described capsule of the invention. In particular, said housing will bear a configuration complementary to the above-illustrated one of the grooves 5 and ribs 52.

[0023] The present invention has been hereto described with reference to preferred embodiments thereof. It is understood that other embodiments might exist, all falling within the concept of the same invention, and all comprised within the protective scope of the claims hereinafter.

Claims

1. A capsule (1) of the type containing or apt to contain a substantially granular infusion for making beverages such as coffee and the like in an extraction process providing the passing through the capsule itself by an extraction fluid, said capsule (1) comprising a main body (2, 3, 4) defining an internal housing (10) apt to receive said infusion (C), **characterized in that** said main body (2, 3, 4) has, in correspondence of at least part of the lateral wall (4) of said housing (10), a plurality of internal longitudinal grooves (50) arranged substantially in the direction of the extraction fluid flow and apt to convey such a fluid through the capsule (1) itself.

2. The capsule (1) according to claim 1, wherein said internal grooves (50) involve the entire transversal extension of the lateral wall (4) of said housing (10).

3. The capsule (1) according to claim 1 or 2, wherein said internal grooves (50) are equally distributed over said lateral wall (4).

4. The capsule (1) according to any one of the preceding claims, wherein said housing (10) is defined by a top wall (2) in correspondence of which the extraction fluid enters the capsule (1) and wherein said lateral wall (4) has a top portion (41) adjacent to said top wall (2) and void of said internal grooves (50).

5. The capsule (1) according to any one of the preceding claims, wherein said internal grooves (50) have a substantially plane bottom contour.

6. The capsule (1) according to any one of the preceding claims, wherein said main body (2, 3, 4) has, in correspondence of at least part of the lateral wall (4) of said housing (10), a plurality of longitudinal bulges (53) alternating with said internal grooves (50).

7. The capsule (1) according to the preceding claim,

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wherein said internal bulges (53) have a substantially arched contour.

8. The capsule (1) according to the preceding claim, wherein said internal bulges (53) have a contour substantially like an arc of circumference.

9. The capsule (1) according to any one of the preceding claims, wherein said main body (2, 3, 4) has a substantially cylindrical geometry and said lateral wall (4) represents the lateral skirt of the cylinder.

10. The capsule (1) according to any one of the preceding claims, wherein said main body (2, 3, 4) has a top face (2) is at least partly made of a substantially porous material.

11. The capsule (1) according to the preceding claim, wherein said main body (2, 3, 4) has a top face (2) at least partly made of a paper material.

12. The capsule (1) according to any one of the claims 1 to 9, wherein said main body (2, 3, 4) has a top face (2) at least partly made of a substantially impermeable material provided with small holes (81) to allow the entering of the extraction fluid into the capsule (1) itself.

13. The capsule (1) according to the preceding claim, wherein said main body (2, 3, 4) has a top face (2) at least partly made of a plastic material.

14. The capsule (1) according to any one of the preceding claims, wherein said main body (2, 3, 4) has a bottom face (3) at least partly made of a substantially porous material.

15. The capsule (1) according to the preceding claim, wherein said main body (2, 3, 4) has a bottom face (3) at least partly made of a paper material.

16. The capsule (1) according to any one of the claims 1 to 13, wherein said main body (2, 3, 4) has a bottom face (3) at least partly made of a substantially impermeable material provided with small holes to allow the exiting of the extraction fluid from the capsule (1) itself.

17. The capsule (1) according to the preceding claim, wherein said main body (2, 3, 4) has a bottom face (3) at least partly made of a plastic material.

18. The capsule (1) according to any one of the preceding claims, which is a single-dose capsule (1).

19. The capsule (1) according to any one of the preceding claims, containing ground coffee (C) received in said housing (10).

20. The capsule (1) according to any one of the preceding claims, having an external lateral skirt (4) bearing a shaped external contour complementarily reproducing said internal grooves (50), such a contour being provided with longitudinal ribs (52) in correspondence of said internal grooves (50).

21. An automatic machine for making beverages such as coffee and the like from a capsule (1) according to the preceding claim and containing a substantially granular infusion, said machine comprising: extraction means apt to cause the passing through the capsule itself by an extraction fluid; and a housing apt to receive said capsule (1) and having a contour of shape substantially complementary to that of the shaped external contour of the capsule itself.

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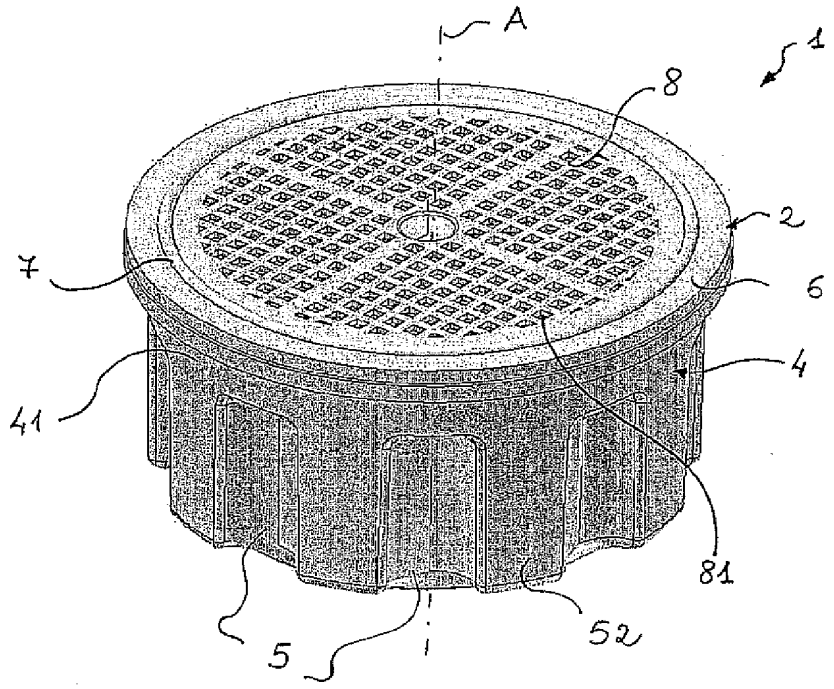


FIG. 1

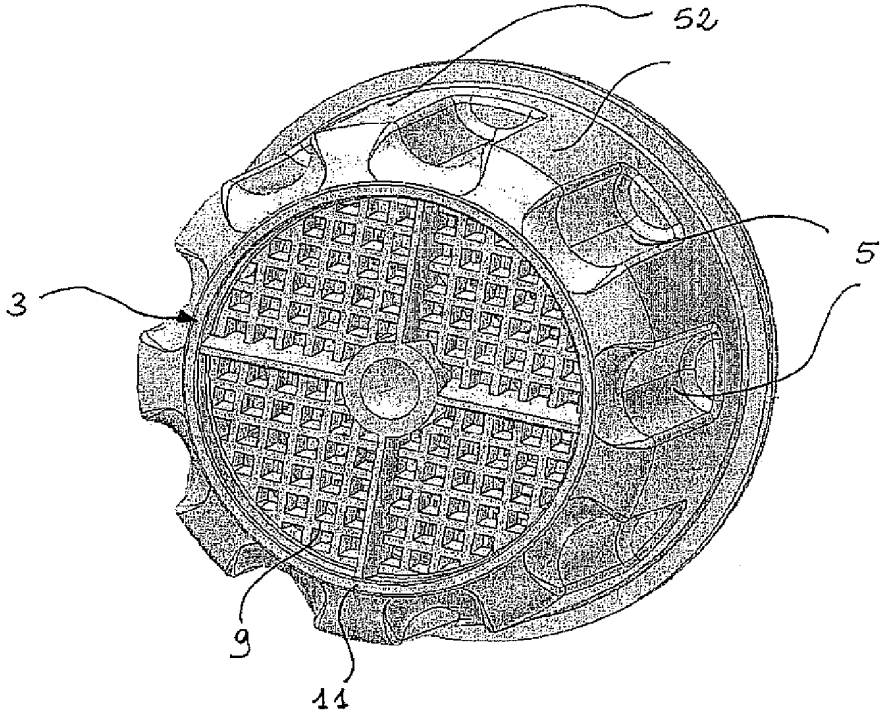


FIG. 2

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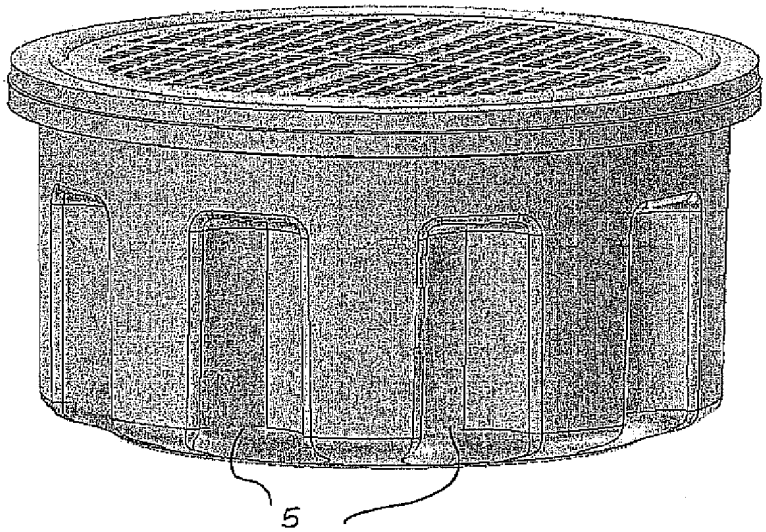


FIG. 3

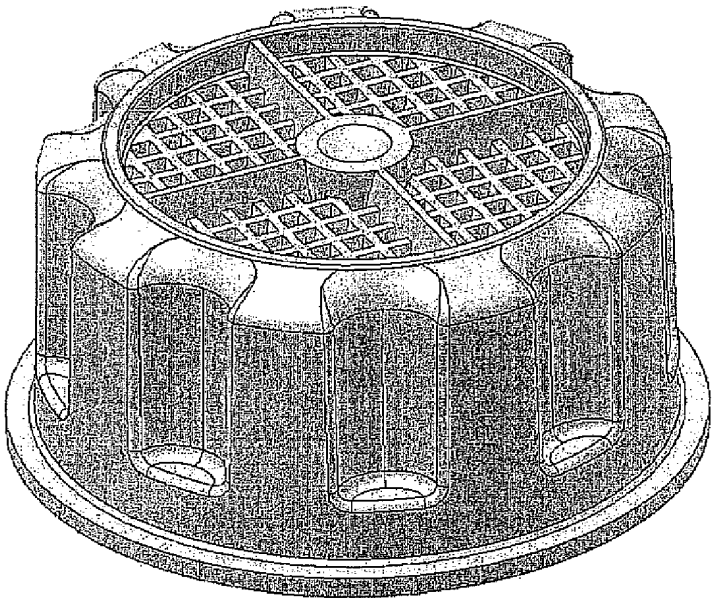


FIG. 4

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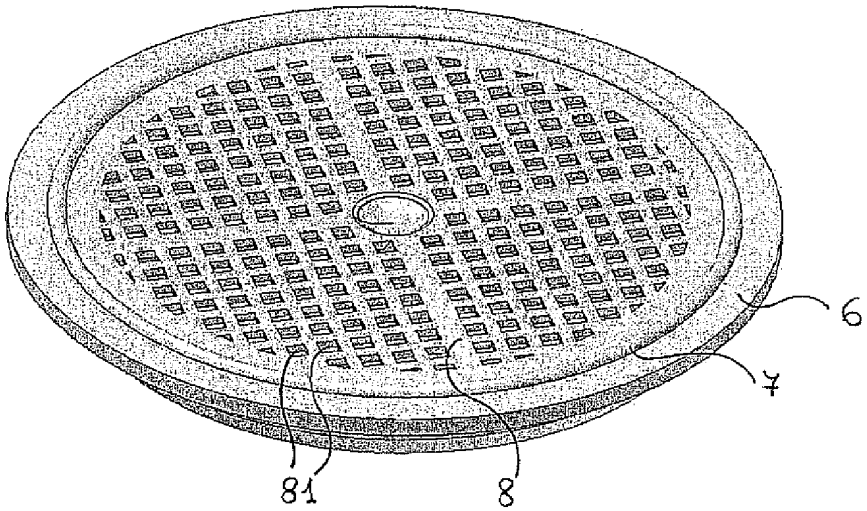


FIG. 5

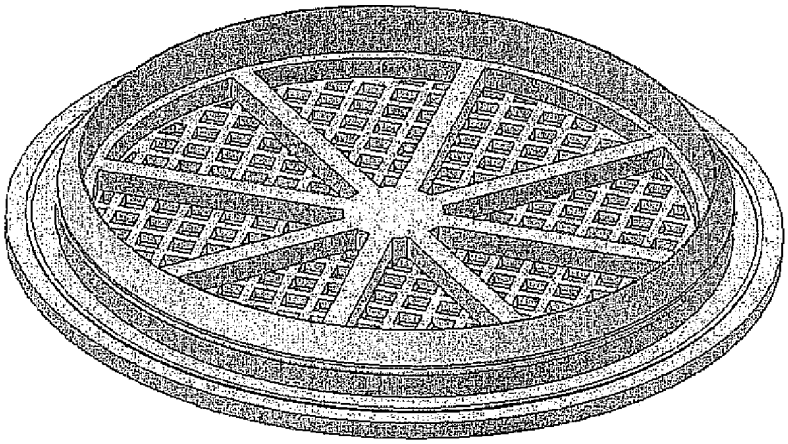


FIG. 6

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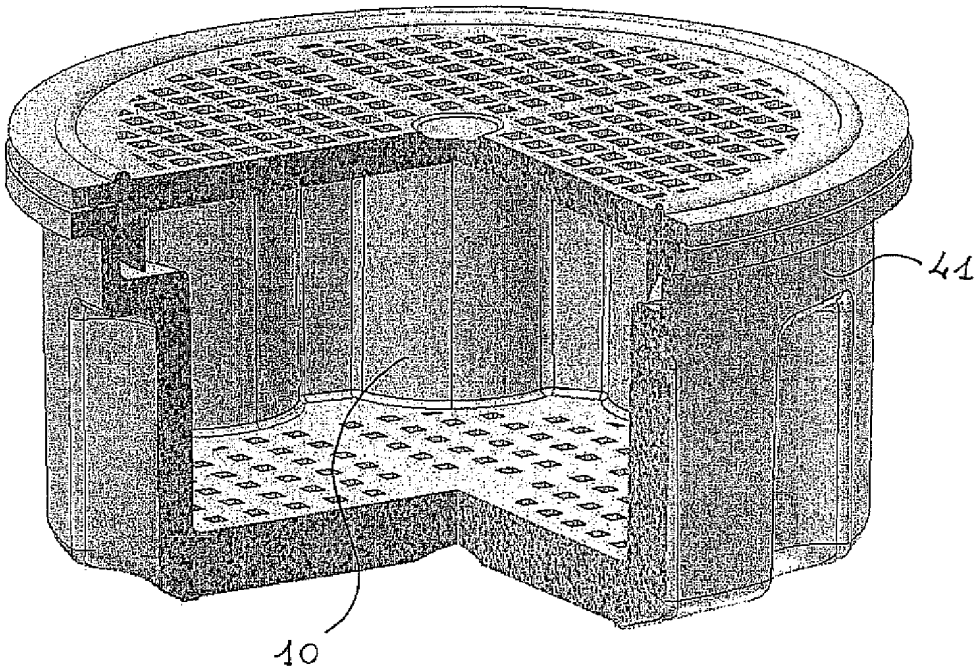


FIG. 7

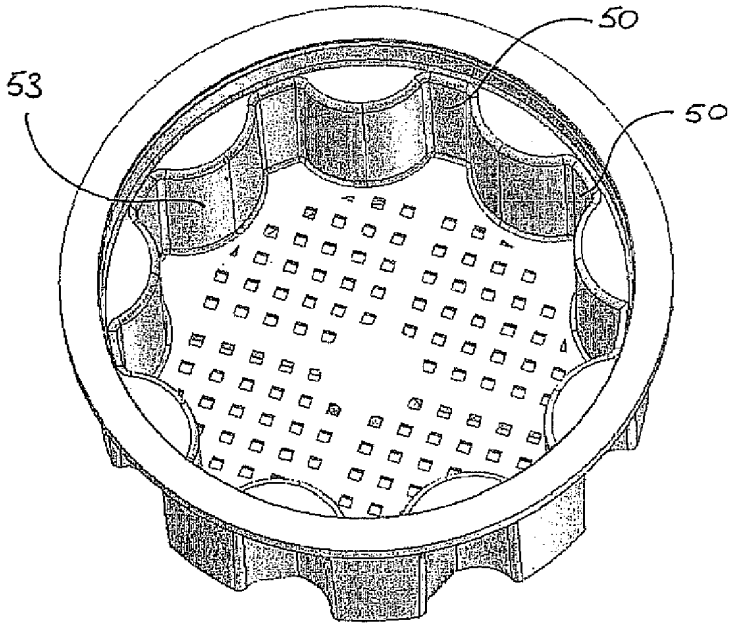


FIG. 8

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European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 10 6724

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 800 089 A (SCOTT GEORGE W [US]) 24 January 1989 (1989-01-24) * column 1, line 58 - column 2, line 42; figure 4 * -----	1-3,5, 9-11,14, 15,18-21	INV. B65D85/804
X	US 3 309 980 A (BOZEK JOHN S) 21 March 1967 (1967-03-21) * the whole document * -----	1-3,6-9, 12,13, 16-21	
A	DE 34 32 339 A1 (GESEN WOLFGANG; SCHULTE WILHELM) 13 March 1986 (1986-03-13) * the whole document * -----	1	

TECHNICAL FIELDS SEARCHED (IPC)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	30 July 2007	Balz, Oliver

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
O : non-written disclosure
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EPO FORM 1503 03.82 (P04C01)

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 10 6724

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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30-07-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4800089 A	24-01-1989	NONE	
US 3309980 A	21-03-1967	NONE	
DE 3432339 A1	13-03-1986	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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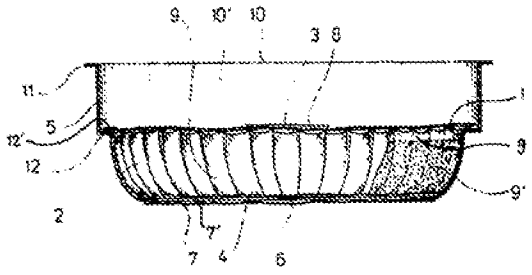
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Prüfungsantrag gem. § 44 PatG ist gestellt

(54) Kaffee-Kompaktfilter

Kaffee-Kompaktfilter, bestehend aus einem oben und unten offenen Filtergehäuse mit je einer darin fest angebrachten oberen und unteren Filterpapierlage, zwischen denen eine bestimmte Menge gemahlenen Kaffees eingebracht ist, wobei zwischen oberer und unterer Filterpapierlage (1 und 4) randseitig entlang der Innenseite des Filtergehäuses (10') ein Filterpapiereinsatz (2) angeordnet ist, der mit der Innenseite des Gehäuses (10') nicht oder nur teilweise in Berührung steht und mit der unteren Filterpapierlage (4) verbunden oder einstückig ist, und Kaffee-Maschine für die Verwendung des Kaffee-Kompaktfilters (10), die eine bewegbar mit dem Gehäuse der Maschine verbundene Aufnahmevorrichtung mit einer Öffnung zur Aufnahme des Kaffee-Kompaktfilters (10) aufweist.



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BUNDESDRUCKEREI 01. 86 608 011/295

Patentansprüche:

1. Kaffee-Kompaktfilter, bestehend aus einem oben und unten offenen Filtergehäuse mit je einer darin fest angebrachten oberen und unteren Filterpapierlage, zwischen denen eine bestimmte Menge gemahlenen Kaffees eingebracht ist,
dadurch gekennzeichnet, daß zwischen oberer und unterer Filterpapierlage (1 und 4) randseitig entlang der Innenseite des Filtergehäuses (10') ein Filterpapiereinsatz (2) angeordnet ist, der mit der Innenseite des Gehäuses (10') nicht oder nur teilweise in Berührung steht und mit der unteren Filterpapierlage (4) verbunden oder einstückig ist.

2. Kaffee-Kompaktfilter nach Anspruch 1, dadurch gekennzeichnet, daß der randseitig angeordnete Filterpapiereinsatz (2) aus geriffeltem, gewelltem, zickzack-förmig gefaltetem oder ähnlich geformtem Filterpapier besteht, so daß zwischen dem randseitig angeordneten Filterpapiereinsatz (2) und der Innenseite des Gehäuses (10') ein Ringkanal bzw. mehrere etwa parallele Kanäle (13) mit einer im wesentlichen vertikalen Achse gebildet werden, die nach unten offen sind.

3. Kaffee-Kompaktfilter nach den Ansprüchen 1 und 2, dadurch gekennzeichnet, daß die das Kaffeemehl (9') abdeckende obere Filterpapierlage (1) eine automatische Entlüftung (3) aufweist, die sich unter dem Einfluß von heißem Wasser oder Wasserdampf öffnet.

4. Kaffee-Kompaktfilter nach den Ansprüchen 1 bis 3, dadurch gekennzeichnet, daß die automatische Entlüftung (3) durch wenigstens einen Schnitt, eine Perforation oder ähnliches in der oberen Filterpapierlage (1), die mit wenigstens einem Klebestreifen (8) oder

ähnlichen abgedeckt ist, der sich unter der Einwirkung von heißem Wasser oder Wasserdampf wenigstens teilweise ablöst, gebildet wird.

5. Kaffee-Kompaktfilter nach den Ansprüchen 1 bis 4, dadurch gekennzeichnet, daß das Filtergehäuse 10' einen für die Aufnahme von heißem, zu Einfüllbeginn noch nicht durch die Filterpapierlagen (1 und 4) und den gemahlenen Kaffee (9') gelaufenem Wasser ausreichend hohen Rand (5) oberhalb der oberen Filterpapierlage (1) des Kompaktfilters (10) aufweist.

6. Kaffee-Kompaktfilter nach den Ansprüchen 1 bis 5, dadurch gekennzeichnet, daß die untere Filterpapierlage (4) des Kompaktfilters (10) durch ein darunterliegendes, mit dem Filtergehäuse (10') verbundenes oder einstückiges Trag- und Abstandselement (6) in Form eines Kreuzes, eines Sterns, eines Gitters oder ähnliches unterstützt wird.

7. Kaffee-Kompaktfilter nach den Ansprüchen 1 bis 6, dadurch gekennzeichnet, daß das Filtergehäuse (10') unterhalb des Trag- und Abstandselementes (6) eine weitere Filterlage (7) in Form eines Kunststoffgazefilters, eines Papierfilters oder ähnliches aufweist, die durch das Trag- und Abstandselement (6) von der unteren Filterpapierlage (4) des Kompaktfilters (10) auf Abstand gehalten wird.

8. Kaffee-Maschine für die Verwendung des Kaffee-Kompaktfilters (10) nach den Ansprüchen 1 bis 7, dadurch gekennzeichnet, daß die Maschine (14) eine bewegbar mit dem Gehäuse der Maschine (14) verbundene Aufnahmevorrichtung (15) mit einer Öffnung zur Aufnahme des Kaffee-Kompaktfilters (10) aufweist.

9. Kaffee-Maschine nach Anspruch 8, dadurch gekennzeichnet, daß die Maschine (14) eine Führung (15') zum Einschieben oder Einlegen des Filters (10) aufweist.

10. Kaffee-Maschine nach Anspruch 9, dadurch gekennzeichnet, daß sie unterhalb der Führung (15') eine mit dieser verbundene oder einstückige, etwa trichterförmige Sammel- und Ableitvorrichtung (16) für den aus dem Kaffee-Kompaktfilter (10) austretenden Kaffeesud aufweist.

11. Kaffee-Maschine nach Anspruch 8, dadurch gekennzeichnet, daß die Aufnahmevorrichtung (15) für die Aufnahme des Kaffee-Kompaktfilters (10) in ihrem unteren Bereich, d. h. bei eingelegtem Kompaktfilter (10) unter diesem, eine etwa trichterförmige Sammel- und Ableitvorrichtung (16) für den austretenden Kaffeesud aufweist, die mit der Aufnahmevorrichtung (15) verbunden oder einstückig ist.

12. Kaffee-Maschine nach den Ansprüchen 8 bis 11, dadurch gekennzeichnet, daß die Aufnahmevorrichtung (15) für die Aufnahme des Kaffee-Kompaktfilters (10) eine nur geringfügig größere Höhe als der Kaffee-Kompaktfilter (10) selbst aufweist.

Kaffee-Kompaktfilter

Die Erfindung bezieht sich auf ein Kaffee-Kompaktfilter, bestehend aus einem oben und unten offenen Filtergehäuse mit je einer darin fest angebrachten oberen und unteren Filterpapierlage, zwischen denen eine bestimmte Menge gemahlenen Kaffees eingebracht ist, sowie aus einer Kaffee-Maschine für die Aufnahme des Kaffee-Kompaktfilters.

Neben herkömmlichen Filtertüten, die in ein etwa trichterförmiges Filtergefäß eingesetzt und von Hand mit gemahlenem Kaffee gefüllt werden, sind schon seit längerem sogenannte Kaffee-Kompaktfilter gebräuchlich, die aus einem oben und unten offenen Filtergehäuse mit je einer darin fest angebrachten oberen und unteren Filterpapierlage bestehen, zwischen denen eine bestimmte Menge gemahlenen Kaffees eingebracht ist und die als Einsatz in speziellen, dafür geeigneten Kaffeemaschinen verwendet werden und nach einmaligem Gebrauch komplett fortgeworfen werden. Kompaktfilter werden vor allem dort verwendet, wo größere Mengen Kaffeesud in kurzer Zeit erzeugt werden sollen, d. h. vor allem im gastronomischen Bereich.

In der Praxis haben derartige Kompaktfilter jedoch einige Nachteile, sowohl aus der Sicht des Verbrauchers als auch des Herstellers, gezeigt.

Als wirksame Filterfläche steht nur die untere Filterpapierlage zur Verfügung, was zur Folge hat, daß der Filtriervorgang, vor allem bei feiner gemahlenem Kaffee, relativ lange dauert, obwohl gerade auch eine kurze Zubereitungszeit gefordert ist.

Ein weiteres Problem stellt das ungleichmäßige Eindringen des aufgegebenen heißen Wassers in die Kaffeemehlfüllung dar. Bei Aufgabe des heißen Wassers wird zuerst die obere Filterpapierlage durchfeuchtet und dadurch sehr wenig durchlässig für gasförmige Stoffe. Während des weiteren Eindringens des Heißwassers in die Kaffeemehlfüllung werden die zwischen den Kaffeepartikeln verbliebene Luft und der entstehende Wasserdampf verdrängt und sammeln sich in einer Blase unterhalb der oberen Filterpapierlage. Die Folge ist eine unerwünschte Verringerung der Fläche, durch die das Heißwasser in die Kaffeemehlfüllung eintritt und damit sowohl eine Verlangsamung des Filtriervorganges als auch eine Verschlechterung der Auslaugung der Kaffeemehlfüllung. Im schlimmsten Fall kann es sogar zum Überlaufen von heißem Wasser und dadurch zu einer Verbrühungsgefahr für den Benutzer kommen, wenn das heiße Wasser nicht schnell genug durch den Filter abfließen kann.

Nachteilig aus der Sicht des Herstellers ist, daß solche Kompaktfilter, die für einmaligen Gebrauch gedacht sind, mehrmals verwendet werden können, indem für die untere Filterpapierlage handelsübliche Filterpapiere eingelegt werden und Kaffeemehl von Hand aufgegeben wird. Häufig sind derartige Kaffee-Maschinen Teil eines sogenannten "Service-Paketes", d. h. für die Maschine selbst entstehen dem Verbraucher keine Kosten, er ist jedoch verpflichtet, regelmäßig eine bestimmte Mindestmenge an Kaffee-Kompaktfiltern eines bestimmten Herstellers zu kaufen. Der Bedarf, der über diese Mindestmenge hinausgeht, wird aber oft nicht bei dem Hersteller des Kom-

paktfilters gedeckt, sondern in Form von preiswerterem Fremd-Kaffee in handelsüblichen Verpackungsformen gekauft. Hierdurch entstehen dem Kompaktfilter-Hersteller bzw. Lieferanten des "Service-Paketes" nicht zu unterschätzende Umsatzverluste.

Es stellt sich daher die Aufgabe, ein Kaffee-Kompaktfilter sowie eine Kaffee-Maschine für die Verwendung des Kompaktfilters zu schaffen, die die oben genannten Nachteile vermeiden, und einerseits insbesondere eine schnelle Zubereitung, eine gute Auslaugung des Kaffeemehls und eine sichere Handhabung für den Verbraucher bieten und andererseits eine Mehrfachverwendung des Kompaktfilters ausschließen.

Die Lösung dieser Aufgabe gelingt erfindungsgemäß durch ein Kaffee-Kompaktfilter, bestehend aus einem oben und unten offenen Filtergehäuse mit je einer fest darin angebrachten oberen und unteren Filterpapierlage, zwischen denen eine bestimmte Menge gemahlenen Kaffees angebracht ist, dadurch gekennzeichnet, daß zwischen oberer und unterer Filterpapierlage randseitig entlang der Innenseite des Filtergehäuses ein Filterpapiereinsatz angeordnet ist, der mit der Innenseite des Gehäuses nicht oder nur teilweise in Berührung steht.

Durch einen derartigen zusätzlichen Filterpapiereinsatz wird die Fläche, durch die der Kaffeesud austreten kann, wesentlich vergrößert. Dies gilt insbesondere dann, wenn der Einsatz aus geriffeltem, gewelltem, zick-zack-förmig gefaltetem oder ähnlich geformtem Filterpapier besteht. Zwischen der Innenwand des Filtergehäuses und dem Filterpapiereinsatz wird bei einem z. B. glatten Einsatz ein Ringkanal gebildet, bei z. B. gewelltem Einsatz ergibt sich eine Anzahl von etwa parallelen Kanälen mit im wesentlichen vertikalen Achsen, die nach unten offen sind und den austretenden Kaffeesud ableiten. Der rand-

seitige Filtereinsatz ist, um ein unerwünschtes Austreten von Kaffeemehl zu verhindern, mit der unteren Filterpapierlage verbunden oder einstückig.

Das Problem der Luft- und Dampfblasenbildung im Inneren des Filters wird dadurch gelöst, daß der erfindungsgemäße Kompaktfilter eine automatische Entlüftung aufweist, die sich erst unter dem Einfluß von heißem Wasser oder Wasserdampf öffnet. Sie besteht beispielsweise aus wenigstens einem Schnitt oder einer Perforation in der oberen Filterpapierlage, die mit einem Klebestreifen oder ähnlichem abgedeckt ist, der sich unter der Einwirkung von heißem Wasser oder Dampf wenigstens teilweise ablöst und so die darunter befindlichen Öffnungen freigibt. Durch diese entweichen zunächst die vom eindringenden Wasser aus dem Kaffeemehl verdrängte Luft und der dort entstehende Wasserdampf. Nach dem Entlüftungsvorgang fließt dann das aufgegebene Heißwasser außer durch die obere Filterpapierlage selbst zum Teil auch durch die darin befindlichen Öffnungen in das Kaffeemehl. Dieser so vergrößerte Durchfluß trägt ebenfalls zu einer kurzen Zubereitungszeit bei, während gleichzeitig durch das vorherige Entlüften das Kaffeemehl gleichmäßiger und intensiver ausgelaugt wird, was nach ersten praktischen Erfahrungen mit dem erfindungsgemäßen Kompaktfilter zu einer Kaffeemehlersparnis von etwa 20 % bei gleichbleibender Qualität des Kaffeesuds führt. Auch das Überlaufen des Filters bei Aufgabe von Heißwasser ist durch den verbesserten Durchfluß praktisch ausgeschlossen, zumal das Kompaktfiltergehäuse nach dieser Erfindung einen für die Aufnahme von heißem, zu Einfüllbeginn noch nicht durch die Filterpapierlagen und den gemahlenen Kaffee gelaufenem Wasser ausreichend hohen Rand oberhalb der oberen Filterpapierlage aufweist.

Die Reißfestigkeit von Filterpapier im feuchten Zustand ist relativ gering. Um die Zugspannungen in der unteren

Filterpapierlage, die das Gewicht von Kaffeemehl und aufgegebenem Wasser aufnehmen muß, gering zu halten, wird diese durch ein darunterliegendes Tragelement, das beispielsweise die Form eines Kreuzes, eines Sterns oder eines Gitters hat und mit dem Filtergehäuse verbunden oder einstückig ist, unterstützt. Ein Einreißen der unteren Filterpapierlage ist so nicht mehr möglich.

Das Tragelement dient gleichzeitig als Abstandselement, das eine unterhalb dieses Trag- und Abstandselementes befindliche weitere Filterlage in Form eines Kunststoffgazefilters, eines Papierfilters oder ähnliches von der unteren Filterpapierlage des Filters zur Sicherung der vollen Durchlässigkeit auf Abstand hält. Durch diese weitere Filterlage werden über die randseitige Filterpapierlage eventuell übergetretene oder durch Beschädigung der unteren Filterpapierlage ausgetretene Kaffeemehlpartikel zurückgehalten, so daß der Kaffeesud sicher fei bleibt von Kaffeemehlanteilen, was sowohl dem Geschmack als auch der Bekömmlichkeit des Getränkes zugute kommt.

Eine Kaffee-Maschine für die Verwendung des erfindungsgemäßen Kaffee-Kompaktfilters weist eine bewegbar mit dem Gehäuse der Maschine verbundene Aufnahmevorrichtung mit einer Öffnung zur Aufnahme des Kaffee-Kompaktfilters auf. Hierdurch wird sowohl ein einfaches Einlegen und Herausnehmen des Kompaktfilters wie auch eine sichere Handhabung gewährleistet, da keine Manipulationen des Benutzers in unmittelbarer Nähe des Heißwasseraustrittes der Maschine erforderlich sind. Die Öffnung in der Aufnahmevorrichtung ist so bemessen und gelegen, daß der Kompaktfilter beispielsweise auf einem vorstehenden Kragen oder einem Vorsprung seines Gehäuses rundum- bzw. allseitig aufliegt.

Um den aus dem Kompaktfilter austretenden Kaffeesud zu sammeln und in ein darunter befindliches Auffanggefäß zu leiten, weist die Kaffee-Maschine nach der Erfindung eine etwa trichterförmige Sammel- und Ableitvorrichtung auf, die beispielsweise unterhalb der Führung zum Einschieben oder Einlegen des Filters mit der Führung verbunden oder einstückig ist oder mit der Aufnahmevorrichtung in deren unterem Bereich, d. h. bei eingelegtem Kompaktfilter unter diesem, verbunden oder einstückig ist. Mit dieser Sammel- und Ableitvorrichtung wird erreicht, daß der Kaffeesud auch in Auffanggefäße, wie z. B. Glaskannen, mit relativ kleiner Einfüllöffnung eingeleitet wird, ohne daß ein Teil des Kaffeesuds neben die Einfüllöffnung gerät.

Eine Mehrfachverwendung des Kompaktfilters bzw. Verwendung von Fremdprodukten wird durch folgende Merkmale des erfindungsgemäßen Kompaktfilters und der Kaffee-Maschine weitgehend ausgeschlossen:

Filterpapiereinsätze, bestehend aus einer flachen Filterpapierlage mit einem daran anschließenden randseitigen Filterpapierteil, sind nicht im Handel, d. h. der Filterpapiereinsatz kann nicht durch einen mehr oder weniger ähnlichen handelsüblichen Einsatz ersetzt werden. Wird lediglich die untere Filterpapierlage durch einen z. B. handelsüblichen Papierrundfilter ersetzt, kommt es wegen des verringerten Durchflusses infolge verkleinerter Filterfläche zu einem Überlaufen des aufgegebenen Heißwassers aus dem Filtergehäuse, was, wenn es mehrmals geschieht, den Benutzer von dieser Mehrfachverwendung abbringen wird.

Bekannte, im Handel befindliche Kompaktfilter, wie eingangs beschrieben, scheiden ebenfalls für einen Einsatz in der erfindungsgemäßen Kaffeemaschine aus, da diese Filter keinen erhöhten Rand für noch nicht durch Filter-

papierlagen und Kaffeemehl gelaufenes Wasser aufweisen und auch die Schublade für die Aufnahme des Kompaktfilters keinen entsprechenden Raum für die Wasseraufnahme bietet.

Die Verwendung schließlich von Kompaktfiltern, die eine größere Höhe aufweisen als der erfindungsgemäße Kompaktfilter, ist wegen der begrenzten Höhe der Schublade unterbunden, da die Schublade mit einem solchen höheren Kompaktfilter nicht mehr in die Kaffeemaschine einschiebbar ist.

Die Erfindung wird im folgenden anhand der Zeichnung eines bevorzugten Ausführungsbeispieles des erfindungsgemäßen Kaffee-Kompaktfilters sowie der erfindungsgemäßen Kaffee-Maschine für die Aufnahme des Kompaktfilters näher erläutert. Es zeigen im einzelnen:

Figur 1 einen erfindungsgemäßen Kaffee-Kompaktfilter, teils in Seitenansicht, teils in Vertikalschnitt,

Figur 2 eine Draufsicht auf einen Querschnitt in horizontaler Ebene des Kompaktfilters,

Figur 3 eine Seitenansicht einer Kaffeemaschine für die Aufnahme des Kompaktfilters.

Wie aus den Figuren 1 und 2 zu entnehmen ist, besteht das hier dargestellte Ausführungsbeispiel des Kompaktfilters 10 aus einem Filtergehäuse 10', das einen vorstehenden Kragen 11 im oberen Bereich, einen erhöhten Rand 5 und eine zurückspringende Stufe 12 aufweist. Im Inneren des Filtergehäuses 10' ist auf der durch die zurückspringende Stufe 12 gebildeten Fläche 12' eine obere Filterpapierlage 1 angebracht, was durch Kleben oder Verschweißen oder ähnliches erfolgt. Die obere

Filterpapierlage 1 weist einen Schnitt bzw. eine Perforation 3 auf, die mit einem Klebestreifen 8 abgedeckt ist. Unterhalb der oberen Filterpapierlage 1 befindet sich randseitig angeordnet ein Filterpapiereinsatz 2, der zur Vergrößerung der Filterfläche gewellt oder gefaltet oder ähnlich geformt ist. Unterhalb des Einsatzes 2 liegt die untere Filterpapierlage 4, die mit dem Einsatz 2 verbunden oder einstückig ist. Der Raum 9, der durch obere und untere Filterpapierlage 1 und 4 und den Filterpapiereinsatz 2 gebildet wird, ist wenigstens teilweise mit Kaffeemehl 9' gefüllt. Durch die randseitige Lage des oberflächenvergrößernd geformten Einsatzes 2 in dem Filtergehäuse 10' entstehen Kanäle 13 mit etwa parallelen und vertikalen Achsen. Die untere Filterpapierlage 4 wird von Trag- und Abstandselementen 6 unterstützt, die mit dem Filtergehäuse 10' verbunden oder einstückig sind. Gleichzeitig halten die Trag- und Abstandselemente 6 eine weitere Filterlage 7, vorzugsweise ein Kunststoffgazefilter, von der unteren Filterpapierlage 4 auf Abstand, so daß zwischen beiden ein Raum 7' gebildet wird, in den der durch die Kanäle 13 abgeleitete Kaffeesud vor dem Durchströmen der Filterlage 7 zunächst einströmt und wo eventuell ausgetretene Kaffeemehlpartikel zurückgehalten werden.

Figur 3 zeigt eine Seitenansicht einer Kaffeemaschine 14, die für die Aufnahme des erfindungsgemäßen Kompaktfilters 10 ausgerüstet ist. Eine bewegbare Aufnahmevorrichtung 15, im Ausführungsbeispiel eine Schublade, enthält den Kompaktfilter 10, der eine nur geringfügig kleinere Höhe als die Aufnahmevorrichtung 15 selbst hat. Gestrichelt eingezeichnet ist die Lage der Schublade in herausgezogenem Zustand. Unterhalb des Kompaktfilters 10 bzw. der Aufnahmevorrichtung 15 ist ein trichterförmiges Sammel- und Ableitelement 16 vorhanden, das den aus dem Kompaktfilter 10 austretenden Kaffeesud in ein Auffanggefäß 17 leitet.

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Fig.1

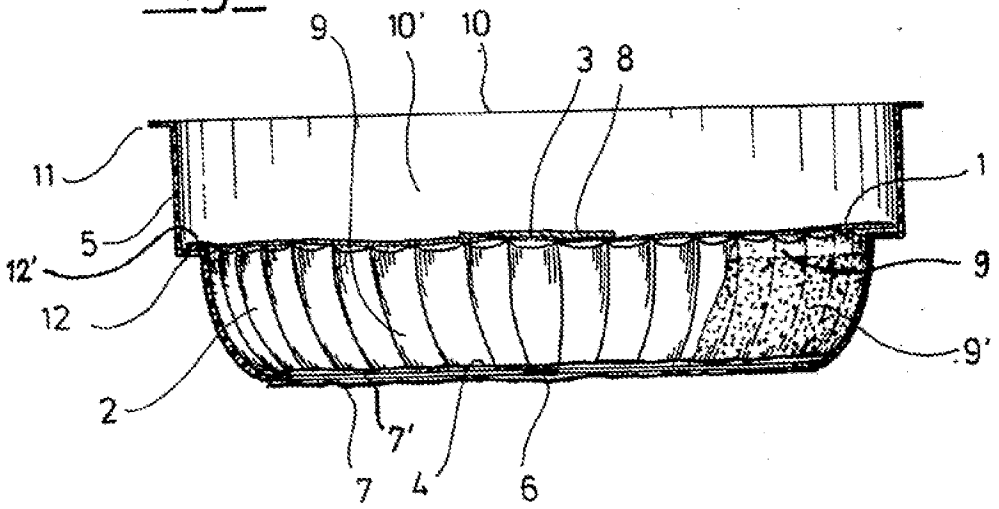
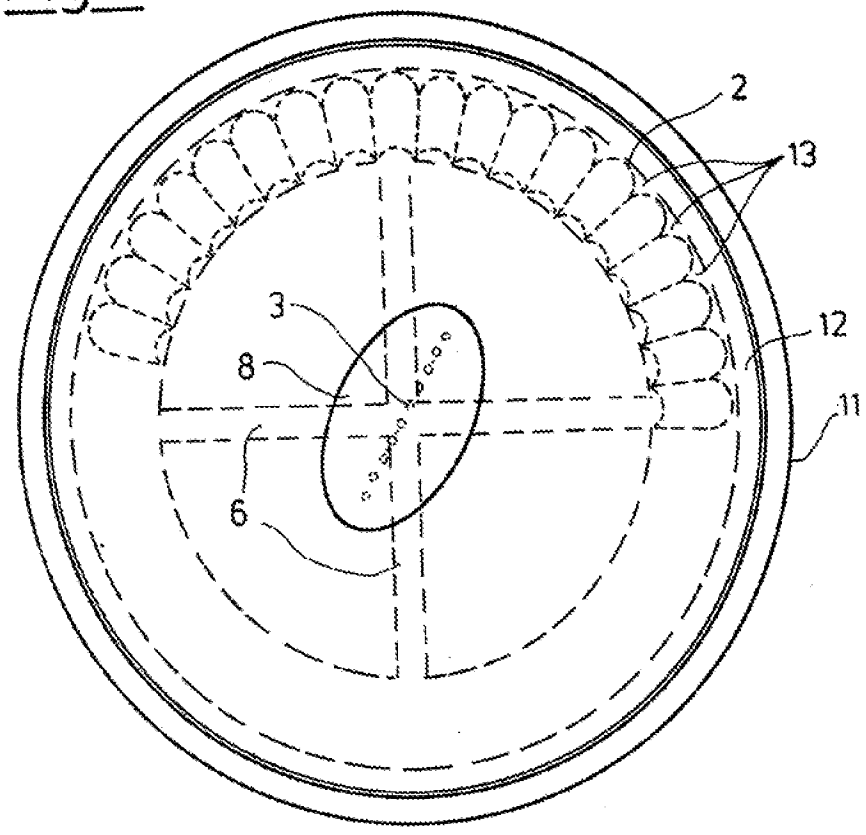


Fig.2



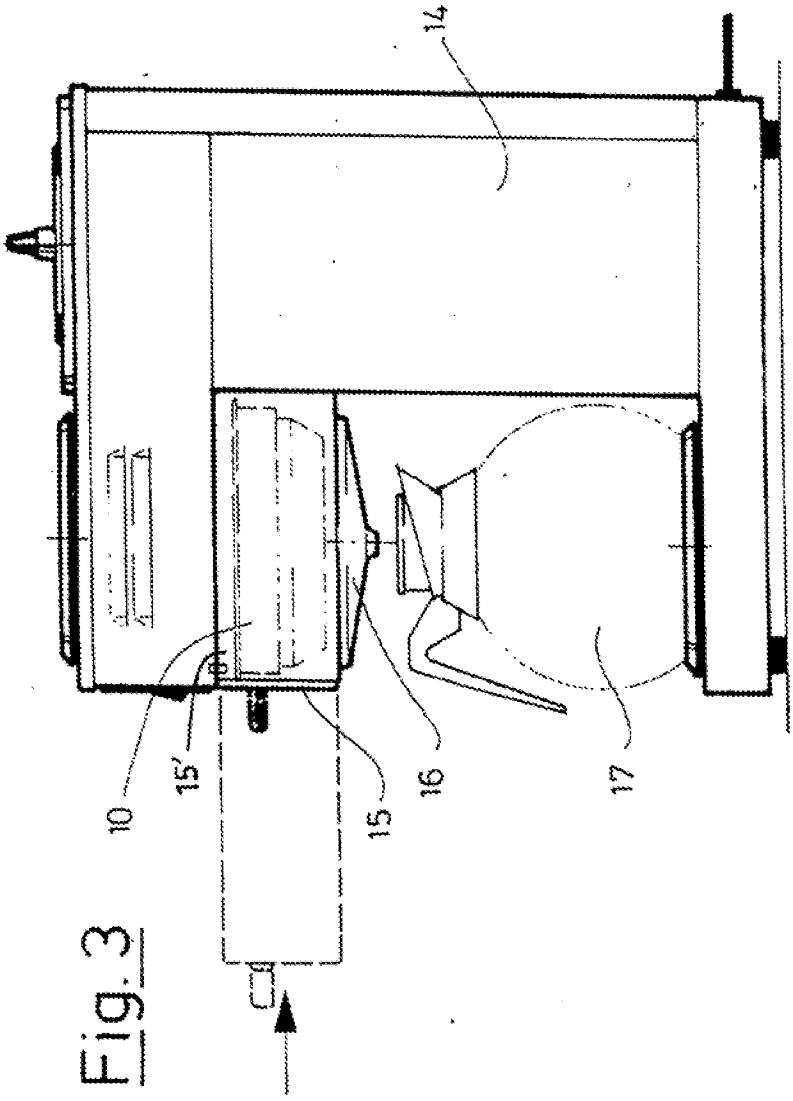


Fig.3

Espacenet

Bibliographic data: DE3432339 (A1) — 1986-03-13

Compact filter for coffee

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Abstract of DE3432339 (A1)

A compact filter for coffee, consisting of a filter housing which is open at the top and bottom having in each case an upper and lower layer of filter paper arranged firmly therein, between which layers of filter paper a particular quantity of ground coffee is introduced, a filter paper insert (2) being arranged between the upper and lower layers of filter paper (1 and 4) at the edge along the inside of the filter housing (10'), which filter paper insert does not contact or only partially contacts the inside of the housing (10') and is connected to or is integral with the lower layer of filter paper (4), and a coffee machine for using the compact filter (10) for coffee, which machine has a receiving device, connected movably to the housing of the machine, with an opening for receiving the compact filter (10) for coffee.

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DESCRIPTION DE3432339

Coffee compact filter

The invention relates to a coffee compact filter, consisting of a top and bottom open filter housing, each with a fixed upper and lower filter paper layer between which a certain amount of ground coffee is inserted, as well as from a coffee machine for receiving the coffee compact filter.

In addition to conventional filter bags, which are inserted into an approximately funnel-shaped filter vessel and filled with ground coffee by hand, have been used for some time so-called coffee compact filter consisting of a top and bottom open filter housing, each with a firmly mounted upper and lower filter paper layer between which a a certain amount of ground coffee is used and used as an insert in special suitable coffee machines and completely discarded after a single use. Compact filters are mainly used where larger amounts of coffee are to be generated in a short time, d. H. especially in the gastronomic area.

In practice, however, such compact filters have shown some disadvantages, both from the consumer's and the manufacturer's point of view.

Only the lower filter paper layer is available as an effective filter surface, with the result that the filtering process, especially with finely ground coffee, takes a relatively long time, although a short preparation time is also required.

Another problem is the uneven penetration of the abandoned hot water in the coffee grounds filling. Upon application of the hot water, first the upper filter paper layer is moistened and thereby very little permeable to gaseous substances. During the further penetration of the hot water into the coffee grounds filling, the air remaining between the coffee particles and the resulting water vapor are displaced and collect in a bubble below the upper filter paper layer. The result is an undesirable reduction in the area through which the hot water enters the coffee grounds filling and thus both slowing down the filtering process and worsening the leaching of the ground coffee filling. In the worst case, it can even lead to overflowing of hot water and thereby to a risk of scalding for the user, if the hot water can not drain fast enough through the filter.

It is disadvantageous from the manufacturer's point of view that such compact filters intended for single use can be used several times by placing commercially available filter papers for the lower filter paper layer and hand-feeding coffee meal. Frequently such coffee machines are part of a so-called "service package", i. H. for the machine itself, the consumer does not incur any costs, but is obliged to regularly purchase a certain minimum amount of coffee compact filters from a particular manufacturer. However, the demand that goes beyond this minimum quantity is often not covered by the manufacturer of the compact filter, but bought in the form of cheaper foreign coffee in commercial packaging. This results in the compact filter manufacturer or Suppliers of the "service package" should not be underestimated.

It is therefore an object to provide a coffee pop-filter and a coffee machine for the use of the compact filter, which avoid the above-mentioned disadvantages, and on the one hand, in particular a quick preparation, a good leaching of the ground coffee and safe handling for the consumer and on the other hand exclude a multiple use of the compact filter.

The solution of this object is achieved according to the invention by a coffee compact filter, consisting of a top and bottom open filter housing, each with a fixed therein upper and lower filter paper layer between which a certain amount of ground coffee is attached, characterized in that between upper and lower filter paper layer edge along the Inside the filter housing a filter paper insert is arranged, which is not or only partially in contact with the inside of the housing.

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Such an additional filter paper insert significantly increases the area through which the coffee sud can escape. This is especially true when the insert is made of corrugated, corrugated, zig-zag folded or similar shaped filter paper.

Between the inner wall of the filter housing and the filter paper insert is at a z. B. smooth use an annular channel formed at z. Corrugated insert results in a number of substantially parallel channels having substantially vertical axes which are open at the bottom and divert the escaping coffee sud. The edge-side filter element is connected to the lower filter paper layer or in one piece in order to prevent unwanted escape of ground coffee.

The problem of air and vapor bubble formation inside the filter is solved by the fact that the compact filter according to the invention has an automatic vent which opens only under the influence of hot water or steam. It consists, for example, of at least one cut or perforation in the upper filter paper ply, which is covered with an adhesive strip or the like, which at least partially peels away under the action of hot water or steam and thus releases the openings underneath. Through this, the air escaping from the ground coffee and the steam arising therefrom first escape. After the deaeration process, the abandoned hot water then flows partly through the openings therein into the ground coffee except through the upper filter paper layer itself.

This thus increased flow also contributes to a short preparation time, while at the same time leaching the ground coffee more evenly and more intensively, resulting in first practical experience with the compact filter according to the invention to a coffee flour savings of about 20% with constant quality of Kaffeesuds. Also, overflow of the filter when hot water is dispensed is virtually eliminated by the improved flow, especially since the compact filter housing of this invention has a sufficiently high edge above the upper filter paper layer to accommodate hot water not yet running through the filter paper layers and ground coffee at the start of filling.

The tear strength of filter paper in the wet state is relatively low. In order to minimize the tensile stresses in the lower filter paper layer, which must absorb the weight of ground coffee and added water, it is assisted by an underlying support member having, for example, the shape of a cross, a star, or a grid and connected or integral with the filter housing , A tearing of the lower filter paper layer is no longer possible.

The support element also serves as a spacer which keeps a further filter layer beneath this support and spacer element in the form of a plastic gauze filter, a paper filter or the like away from the lower filter paper layer of the filter to ensure full permeability. Through this filter layer further more filtered over the marginal filter paper layer or leaked by damaging the lower filter paper layer ground coffee particles are retained, so that the coffee remains safe fei of coffee grounds shares, both the taste and the digestibility of the beverage benefits.

A coffee machine for use with the coffee compact filter of the present invention includes a receptacle movably connected to the housing of the machine and having an opening for receiving the coffee compact filter. This assures easy insertion and removal of the compact filter as well as safe handling since no manipulation of the user is required in the immediate vicinity of the hot water outlet of the machine. The opening in the receiving device is sized and located so that the compact filter, for example, on a protruding collar or a projection of its housing all-round or

rests on all sides.

In order to collect the escaping coffee from the compact filter and to guide it into a receptacle located underneath, the coffee machine according to the invention comprises an approximately funnel-shaped collecting and discharging device, which is connected or integral with the guide, for example below the guide for insertion or insertion of the filter with the receiving device in its lower area, d. H. with inserted compact filter under this, connected or einstückigigist. With this collecting and discharging device is achieved that the coffee dregs also in collecting vessels, such.

B. glass cans, is introduced with a relatively small filling opening without a part of the Kaffeesuds next to the filling opening.

A multiple use of the compact filter or Use of foreign products is largely ruled out by the following features of the compact filter and the coffee machine according to the invention: filter paper inserts consisting of a flat filter paper layer with a subsequent filter paper edge part are not commercially available, i. H. the filter paper insert can not be replaced by a more or less similar commercial use. If only the lower filter paper layer is replaced by a z. For example, as commercial paper round filters are replaced, because of the reduced flow due to reduced filter area, overflow of the discontinued hot water from the filter housing will occur, which, if it happens several times, will divert the user from this reuse.

Known commercially available compact filters, as described in the beginning, are also ruled out for use in the coffee machine according to the invention, since these filters do not have a raised edge for water not yet passed through filter paper layers and coffee grounds and also the drawer for receiving the compact filter does not have a corresponding space for water absorption offers.

Finally, the use of compact filters having a greater height than the compact filter according to the invention is prevented because of the limited height of the drawer, since the drawer with such a higher compact filter is not insertable into the coffee

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machine.

The invention will be explained in more detail below with reference to the drawing of a preferred embodiment of the coffee compact filter according to the invention and the coffee machine according to the invention for receiving the compact filter. 1 shows a coffee compact filter according to the invention, partly in side view, partly in vertical section, FIG. 2 shows a plan view of a cross section in the horizontal plane of the compact filter, FIG. 3 shows a side view of a coffee machine for receiving the compact filter.

As can be seen from Figures 1 and 2, the illustrated embodiment of the compact filter 10 consists of a filter housing 10 ', which has a protruding collar 11 in the upper region, a raised edge 5 and a recessed level 12. Inside the filter housing 10 '. On the surface 12 'formed by the recessed step 12, an upper filter paper sheet 1 is attached, which is done by gluing or welding or the like. The upper filter paper layer 1 has a cut or perforation 3 which is covered with an adhesive strip 8. Below the upper filter paper layer 1, there is arranged on the edge side a filter paper insert 2, which is corrugated or folded or similarly shaped to enlarge the filter surface. Below the insert 2 is the lower filter paper layer 4, which is connected to the insert 2 or 'one piece. The space 9 formed by upper and lower filter paper layers 1 and 4 and the filter paper insert 2 is at least partially filled with ground coffee 9 '.

The edge-side position of the surface-enlarging shaped insert 2 in the filter housing 10 'creates channels 13 with approximately parallel and vertical axes. The lower filter paper ply 4 is supported by support and spacer elements 6 connected or integral with the filter housing 10 '. At the same time support and Abstandseemente6 hold another filter layer 7, preferably a Runststoffgazefilter, from the lower filter paper layer 4 at a distance, so that between the two a space 7 'is formed, in which the coffee 13 derived by the channels 13 coffee flows before flowing through the filter layer 7 first and where any leaked coffee flour particles are retained.

Figure 3 shows a side view of a coffee machine 14, which is equipped for receiving the compact filter 10 according to the invention. A movable receiving device 15, in the exemplary embodiment a drawer, contains the compact filter 10, which only has a slightly smaller height than the receiving device 15 itself.

The position of the drawer in the extracted state is indicated by dashed lines. Below the compact filter 10 or the receiving device 15 funnel-shaped collecting and diverting element 16 is present, which directs the coffee from the compact filter 10 escaping into a collecting vessel 17.

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CLAIMS DE3432339

Claims: 1. Coffee compact filter, comprising a top and bottom open filter housing, each having a fixed therein upper and lower filter paper layer, between which a certain amount of ground coffee is inserted, characterized in that between the upper and lower filter paper layers (1 and 4) along the inside of the filter housing (10 ') a filter paper insert (2) is arranged, which is not or only partly in contact with the inside of the housing (10') and connected to the lower filter paper layer (4) or in one piece.

2.

Coffee compact filter according to claim 1, characterized in that the filter paper insert (2) arranged at the edge consists of corrugated, corrugated, zigzag-shaped or similarly shaped filter paper, so that between the filter paper insert (2) arranged at the edge and the inside of the housing (10 ') Ringkanalbzw. a plurality of approximately parallel channels (13) are formed with a substantially vertical axis, which are open at the bottom

3.

Coffee compact filter according to claims 1 and 2, characterized in that the upper filter paper layer (1) covering the ground coffee (9 ') has automatic ventilation (3) which opens under the influence of hot water or steam.

4.

A coffee pop-filter according to claims 1 to 3, characterized in that the automatic vent (3) is covered by at least one cut, perforation or the like in the upper filter paper ply (1) covered with at least one adhesive strip (8) or the like is formed under the action of hot water or water vapor at least partially peel off.

5.

Compact coffee filter according to claims 1 to 4, characterized in that the filter housing 10 'has a sufficiently high edge (5) for receiving hot, not yet filled by the filter paper layers (1 and 4) and the ground coffee (9')) above the upper filter paper layer (1) of the compact filter (10).

6.

Coffee compact filter according to claims 1 to 5, characterized in that the lower filter paper layer (4) of the compact filter (10) by an underlying, with the filter housing (10 ') connected or integral support and spacer element (6) in the form of a cross , a star, a grid or the like supported.

7.

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Coffee compact filter according to claims 1 to 6, characterized in that the filter housing (10 ') below the supporting and spacer element (6) has a further filter layer (7) in the form of a plastic gauze filter, a paper filter or the like, through the support and Distance element (6) from the lower filter paper layer (4) of the compact filter (10) is kept at a distance.

8.

Coffee machine for using the coffee compact filter (10) according to claims 1 to 7, characterized in that the machine (14) has a receiving device (15) movably connected to the housing of the machine (14) and having an opening for receiving the coffee machine. Compact filter (10).

9.

Coffee machine according to claim 8, characterized in that the machine (14) has a guide (15 ') for insertion or insertion of the filter (10)

10.

Coffee machine according to claim 9, characterized in that it has, below the guide (15 '), a connected or integral therewith, approximately funnel-shaped collecting and discharging device (16) for the coffee brew emerging from the coffee compact filter (10).

11.

Coffee machine according to claim 8, characterized in that the receiving device (15) for receiving the coffee compact filter (10) in its lower area, i. H. with inserted compact filter (10) underneath, a sorter funnel collecting and diverting device (16) for the escaping Kaffeesudaufweist has, connected to the receiving device (15) or in one piece.

12.

Coffee machine according to claims 8 to 11, characterized in that the receiving device (15) for receiving the coffee compact filter (10) has only a slightly greater height than the coffee compact filter (10) itself.

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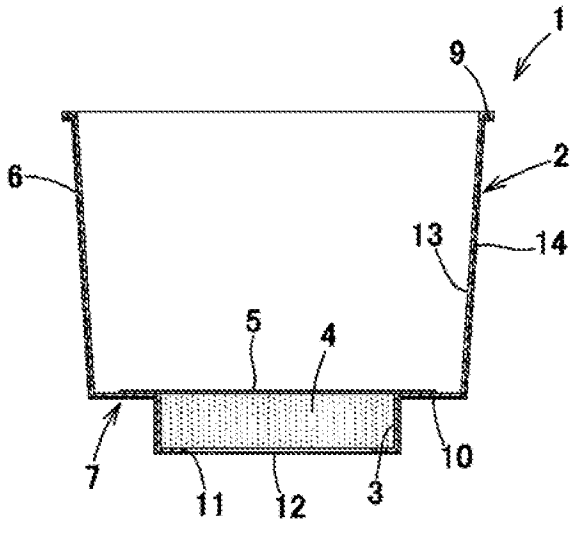
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(54)【発明の名称】　ドリップ用カートリッジ

(57)【要約】
【課題】　安価に製作できて使い捨てが可能で、しかも包装形態の減容化を実現して、流通コストの削減と携行時の利便性を向上し得るドリップ用カートリッジを提供する。
【解決手段】　熱可塑性合成樹脂材料からなり、底面に抽出口１１を形成したカートリッジ形状の基材層１３と、抽出口１１を塞ぐように基材層１３の外面或いは内面の全面にわたってラミネートされ、抽出口１１内においてフィルター１２を構成する熱可塑性合成樹脂材料からなる不織布層１４とを備え、予め抜き穴をあけた熱可塑性合成樹脂シートの少なくとも一方の面に、熱可塑性合成樹脂材料からなるフィルター機能を有する不織布シートを全面にわたってラミネートし、このラミネートしてなる材料シートを抜き穴が抽出口になるようにカートリッジ形状にシート成形した。



【特許請求の範囲】
【請求項１】　熱可塑性合成樹脂材料からなり、底面に抽出口を形成したカートリッジ形状の基材層と、
前記抽出口を塞ぐように基材層の外面或いは内面の全面にわたってラミネートされ、抽出口内においてフィルターを構成する熱可塑性合成樹脂材料からなる不織布層と、
を備えたドリップ用カートリッジ。
【請求項２】　前記カートリッジの底面の中央部に収容部を凹設し、この収容部に焙煎コーヒー粉末を充填し、カートリッジの底面に焙煎コーヒー粉末を収容部内に封止する、通水性を持つ不織布からなる封止シートを貼着した請求項１記載のドリップ用カートリッジ。
【請求項３】　前記カートリッジを柔軟性を有し屈曲可能な熱可塑性合成樹脂シートで構成し、側壁部の上側壁部又は下側壁部を高さ方向の途中部で折り返して反転させ、上側壁部の内側に下側壁部を配置させて全高を低く設定した請求項１又は２記載のドリップ用カートリッジ。
【請求項４】　前記カートリッジの側壁部の高さ方向の途中部に環状段部を形成し、環状段部と反転させる壁部とを円弧面で滑らかに連設させ、環状段部を中心に上側壁部又は下側壁部を折り返して反転させ、上側壁部の内側に下側壁部を配置させて全高を低く設定した請求項１又は２記載のドリップ用カートリッジ。
【請求項５】　反転させる上側壁部又は下側壁部に伸縮方向に延びる縦リブを円周方向に間隔をあけて形成した請求項３又は４記載のドリップ用カートリッジ。
【請求項６】　予め抜き穴をあけた熱可塑性合成樹脂シートの少なくとも一方の面に、熱可塑性合成樹脂材料からなるフィルター機能を有する不織布シートを全面にわたってラミネートし、このラミネートしてなる材料シートを前記抜き穴が抽出口になるようにカートリッジ形状にシート成形するドリップ用カートリッジの製造方法。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は、使い捨て可能な簡易コーヒードリップとして好適に利用可能なドリップ用カートリッジ及びその製造方法に関する。
【０００２】
【従来の技術】焙煎コーヒー用のドリップ用フィルターとしては、漏斗状の専用器具に、袋状に作った不織布や紙製のフィルターをセットして用いるものが広く普及している。また、焙煎コーヒー粉末を不織布製容器に封入してなるカートリッジを専用の器具の底面に装着して使用するものや、耐水紙の本体部とフィルターを組み合わせた使い捨ての一体型カートリッジ等が上市されている。これらのうち専用器具を用いるものは、フィルターやカートリッジは使い捨てであるが、専用器具は使用するたびに洗わねばならず、また、専用器具がかさばることもあり、特にアウトドア等の使用には利便性に欠ける点があった。また耐水紙のカートリッジについては構造が複雑で加工工数が多いため、製造コストが高くつくという問題があった。
【０００３】
【発明が解決しようとする課題】一般には、本体部とフィルター部とを一体化させてなる一体型のドリップ用フィルターを作る場合には、底面に抽出口を形成したカップ状の本体部を製作し、この本体部の底面に抽出口を塞ぐようにフィルターとして作用する不織布や沪紙を接着して製作する方法が採用されている。また、焙煎コーヒーを封入したカートリッジにおいても、焙煎コーヒー粉末を入れた、フィルター機能を果たす不織布容器と、お湯を溜めてフィルターに流す本体部とは、前述したように着脱可能な別部材で構成したり、後加工で両者を接着していることが多い。
【０００４】本出願人は、このことがドリップ用カートリッジやフィルターのコストダウンや利便性向上を阻害する要因のひとつであると考え、お湯を溜める本体部と抽出を行うフィルター部分とを一体に成形することにより、利便性及び生産性が高く、安価に製作可能な使い捨てタイプの焙煎コーヒー用のドリップフィルター付きカートリッジを提供できると考えた。
【０００５】また、従来のドリップ用カートリッジにおいては、利便性を高めるため１回分ずつピロー包装等の個包装にすると、１回分の抽出容量のお湯を溜める本体部の占める容量が大きくてかさばり、輸送並びに保管の効率が著しく悪くなるという問題があった。
【０００６】本発明の目的は、安価に製作できて使い捨てが可能で、しかも包装形態の減容化を実現して、流通コストの削減と携行時の利便性を向上し得るドリップ用カートリッジを提供することである。
【０００７】
【課題を解決するための手段及びその作用】本発明に係るドリップ用カートリッジは、熱可塑性合成樹脂材料からなり、底面に抽出口を形成したカートリッジ形状の基材層と、前記抽出口を塞ぐように基材層の外面或いは内面の全面にわたってラミネートされ、抽出口内においてフィルターを構成する熱可塑性合成樹脂材料からなる不織布層とを備えたものである。
【０００８】このカートリッジは、請求項６記載のような製造方法により製作できる。即ち、予め抜き穴をあけた熱可塑性合成樹脂シートの少なくとも一方の面に、熱可塑性合成樹脂材料からなるフィルター機能を有する不織布シートを全面にわたってラミネートし、このラミネートしてなる材料シートを前記抜き穴が抽出口になるようにカートリッジ形状にシート成形することにより製作できる。
【０００９】より具体的には、このカートリッジは、マッチモールド型による熱プレス成形で製造する。

能で、ポリプロピレン、ポリエステル等の熱可塑性合成樹脂シートに、成形装置の金型配置に対応させて、ドリップ用カートリッジに成形したときに抽出口として機能する抜き穴を１個または複数個設け、その抜き穴を覆う様に、熱可塑性合成樹脂材料からなる、フィルター機能を持つ不織布シートをラミネートしたものを材料シートとし、成形したときに、前記抜き穴がドリップ用カートリッジの底面に形成される抽出口となるよう、前記抜き穴の位置を検出しつつ、フィルター部と本体部とを同時に、一体に成形加工して製作できる。したがって、このカートリッジにおいては、材料シートを製作する段階で、熱可塑性合成樹脂シートに抜き穴を設け、フィルターの役目を果たす不織布シートをラミネートしておいて一体的にシート成形することにより、別工程で抽出口の抜き加工やフィルターの接着を行う必要が無く、安価に効率良くドリップ用カートリッジ容器を製作することが可能となる。

【００１０】ここで、前記カートリッジの底面の中央部に収容部を凹設し、この収容部に焙煎コーヒー粉末を充填し、カートリッジの底面に、その焙煎コーヒー粉末を収容部内に封止する、通水性を持つ不織布からなる封止シートを貼着してもよい。このように構成することで、焙煎コーヒー入りのドリップ用カートリッジを容易に且つ安価に製作できる。また、このカートリッジにおいては、抽出口の穴を抜いたり、下側のフィルターを接着する等の後加工の必要が無いため、一般の成形機付き自動充填ラインで、最終製品までの一貫加工が可能となる。

【００１１】前記カートリッジを柔軟性を有し屈曲可能な熱可塑性合成樹脂シートで構成し、側壁部の上側壁部又は下側壁部を高さ方向の途中部で折り返して反転させ、上側壁部の内側に下側壁部を配置させて全高を低く設定してもよい。この場合には、収納時等においてカートリッジを折り畳んで側壁部の高さを約半分にし、取り扱い時の減容化を図ることができ、使用時には折り返して反転させた上側壁部又は下側壁部を元の形状に引き延ばして容易に使用できる。また、一回分ずつピロー包装等の個包装を行っても、容積を小さくできるため輸送コストの削減が可能となる。

【００１２】前記カートリッジの側壁部の高さ方向の途中部に環状段部を形成し、環状段部と反転させる壁部とを円弧面で滑らかに連設させ、環状段部を中心に上側壁部又は下側壁部を折り返して反転させ、上側壁部の内側に下側壁部を配置させて全高を低く設定してもよい。このような環状段部を形成すると、環状段部を中心に比較的容易に側壁面を折り返すことが可能となり、折り返したときの外周の歪も小さくできる。また、折り返し部の位置が安定し、同じ高さで折り返すことが可能となる。

【００１３】反転させる上側壁部又は下側壁部に伸縮方向に延びる縦リブを円周方向に間隔をあけて形成してもよい。即ち、反転させる壁部においては、成形時に円周の短い内径側が、反転により円周の大きい外径側に配置されるため、該壁部には反転によりシワが発生し易いが、この発明では、反転させる壁部に伸縮方向に延びる縦リブを設けることで、反転させる壁部に対してその周方向に対して若干の伸縮性を付与させて、反転時に発生するシワを吸収して、壁部を反転させた状態でのカートリッジの外観を向上できる。また、使用時にはより容易に、反転した壁面を元へ戻すことが可能となる。尚、反転させる壁部を円周方向に沿って半径方向に振幅する波形状に形成しても同様の作用が得られる。

【００１４】本発明に係るドリップ用カートリッジの製造方法は、予め抜き穴をあけた熱可塑性合成樹脂シートの少なくとも一方の面に、熱可塑性合成樹脂材料からなるフィルター機能を有する不織布シートを全面にわたってラミネートし、このラミネートしてなる材料シートを前記抜き穴が抽出口になるようにカートリッジ形状にシート成形するものである。

【００１５】この製造方法においては、フィルターを一体に成形できるため、別工程で抽出口の穴抜き加工や底面に対するフィルターの接着加工を行う必要がなく、カートリッジの製作コストを低減できる。特に焙煎コーヒーを充填するカートリッジにおいては、一般の成形装置付き自動充填機を使用することにより、一貫して最終製品まで加工することが可能となる。

【００１６】

【発明の実施の形態】以下、本発明の実施例について図面を参照しながら説明する。図１～図３に示すように、ドリップ用カートリッジ１は、カップ状の本体部２と、本体部２の底部に形成した収容部３に充填した焙煎コーヒー粉末４と、本体部２の底面に貼着されて収容部３内に焙煎コーヒー粉末４を封止する封止シート５とを備えている。

【００１７】本体部２について説明すると、本体部２は上側へ行くにしたがって大径となる側壁部６とその底壁部７とを有し、側壁部６の上端部には補強用のフランジ部９が折り返して形成され、底壁部７の外周部にはコーヒーカップ等に上側にカートリッジ１をセットするための略平坦な環状の載置部１０が形成されている。底壁部７の略中央部には収容部３が凹設され、収容部３の底面には抽出口１１が形成され、抽出口１１にはその開口を塞ぐように不織布シートからなるフィルター１２が張設されている。そして、この本体部２の収容部３内に必要量の焙煎コーヒー粉末４を充填し、収容部３の上面開口を塞ぐように不織布からなる封止シート５を載置部１０の上面にヒートシールなどにより接着して、カートリッジ１を製作することになる。尚、抽出口１１は、円形でもよいし多角形でもよい。また、スリット状や扇状や小孔等の複数の孔で構成してもよい。

【００１８】本体部２は、熱可塑性合成樹脂材料からなるカップ状などのカートリッジ形状の基材層１３と、

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出口１１を塞ぐように基材層１３の外面の全面にわたってラミネートされ、抽出口１１内においてはフィルター１２を構成する熱可塑性合成樹脂材料からなる不織布層１４との２層構造に構成され、後述するように、基材層１３を構成する合成樹脂シート５０に抽出口１１に対応させて抜き穴５１を形成し、これに不織布層１４を構成する不織布シート５２をラミネートし、このラミネートしてなる材料シート５４をカートリッジ形状に熱プレス成形して製作されている。但し、不織布層１４は、基材層１３の内面の全面にわたってラミネートしてもよい。また、基材層１３に対応する位置において、不織布層１４に飾り穴等を形成してもよい。

【００１９】基材層１３を構成する熱可塑性合成樹脂としては、ポリプロピレンやポリエチレン等のポリオレフィン系合成樹脂材料や、これらの合成樹脂材料に無機系フィラーを配合したもの及び、ポリエステル、ポリカーボネートなどを好適に利用できる。

【００２０】不織布層１４を構成する不織布としては、長繊維スパンボンド不織布等の成形性を有し、基材層１３に対する熱融着性に優れた素材からなる不織布が好適に利用できる。具体的には、ポリアミド系、ポリアクリロニトリル系、ポリエステル系、ポリビニルアルコール系、ポリプロピレン系、ポリ塩化ビニル系、ポリ塩化ビニリデン系などの熱可塑性合成樹脂材料からなる長繊維スパンボンド不織布を採用できる。また、不織布層１４を構成する不織布（不織布シート５２）の目付は、本体部２内に注いだお湯が適度な速度で焙煎コーヒー粉末４を経てコーヒーカップ内へ供給されるような目付に設定することになる。尚、封止シート５も不織布層１４と同様の素材で構成することになる。

【００２１】本体部２は、カップ状以外の任意の形状に形成することが可能である。また、本体部２の容量は、標準的なコーヒーカップの容量よりもやや大きく設定され、本体部２の設定位置までお湯を注ぐことで、１回分のコーヒーを入れることができるようにしても良いし、本体部２の高さを極力低く設定するため、標準的なコーヒーカップの容量よりも小さな容量に設定して、複数回に分けてお湯を注ぐようにしてもよい。

【００２２】このカートリッジ１は、基本的には使い捨てが可能な簡易のカートリッジで、収容部３内にはコーヒーカップ１杯分のコーヒーを入れることができる分量の焙煎コーヒー粉末４が充填されている。但し、複数杯のコーヒーを入れることができる分量の焙煎コーヒー粉末４を充填することも可能である。

【００２３】このカートリッジ１の使用時には、カートリッジ１をコーヒーカップ等の容器上にセットし、本体部２内にお湯を注ぐだけで、注いだお湯が封止シート５を通って焙煎コーヒー粉末４に供給され、抽出されたコーヒーとともにフィルター１２を通って容器内に供給されることになる。

【００２４】尚、本実施例では、収容部３内に焙煎コーヒー粉末４を充填したが、緑茶や烏龍茶や紅茶などの茶葉を充填して、緑茶や烏龍茶や紅茶などを提供できるように構成することも可能である。

【００２５】また、本実施例では、カートリッジ１に焙煎コーヒー粉末４を備えさせたが、焙煎コーヒー粉末４及び封止シート５を省略して、別途に用意した焙煎コーヒー粉末４を本体部２内に入れて、コーヒーを抽出することも可能である。また、この場合には、図４、図５に示すカートリッジ１Ａのように、前記実施例における本体部２の収容部３に代えて、コーヒーカップに対するカートリッジ１の位置決め用の収容部３よりも深さを浅く設定した位置規制部１５を底壁部７の中央部に凹設したり、収容部３を完全に省略して、底壁部７の中央部に直接的に抽出口１１を形成することになる。

【００２６】前記カートリッジ１は、コーヒーの風味を保持するためにガスバリア性を有するバリアフィルム等で包装して市場に提供される。複数個の集合包装にすると、開封して短期間に使い切れない場合、そのままにすると風味が損なわれるため、残ったものの保存は缶やガラス瓶、またはバリアフィルム製の密閉保存袋等を用いる等の配慮が必要になる。包装形態は、このように特別の配慮を必要としない様に、また、アウトドア等に手軽に携行して利用できるように１回分ずつ個包装にすることが好ましい。しかし、カートリッジ１をピロー包装等で１回分ずつ個包装すると、お湯を溜める本体部２がかさばり、流通コストや販売コストが高くつき、携行にも不便で著しく利便性に欠けるものになってしまう。本出願人は前記問題を解決するため、本体部２の側壁部６をその高さ方向の途中部で折り返して反転させ、カートリッジ１の高さを約半分にすることで、包装形態の減容化を試み、次のような方法を発明した。

【００２７】本体部２の側壁部６の上側壁部又は下側壁部を高さ方向の途中部で折り返して反転できるように、基材層１３として、ポリエチレン、ポリプロピレン、及びそれらポリオレフィン系合成樹脂に無機系フィラーを配合したもの等、比較的柔軟で屈曲可能な特性を持つ熱可塑性合成樹脂シートを採用した。

【００２８】そして、図６（ａ）に示すように、カートリッジ１を倒立状にして略円柱状の受け台２０に装着し、カートリッジ１の下半部に適合するリング状の折り返し治具２１を倒立状にセットしたカートリッジ１に上側から被せ、折り返し治具２１でカートリッジ１の載置部１０を押えつつ、カートリッジ１の口縁部を外側に広げるように引き上げてカートリッジ１の上半部を反転させ、図６（ｂ）に示すように、側壁部６が折り返し治具２１の下端に当たるまで側壁部６を折り返して、カートリッジ１の高さを成形時の約半分に構成し、この状態で個包装することで、包装状態での減容化を可能となした。また、このカートリッジ１の使用時には、折り返し

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だカートリッジ１の口縁部の下面側を両手の指先で保持し、載置部１０を内側から親指で押し下げるようにして本体部２を成形時の状態に復元させることになる。但し、前記と同様の手法で機械的に側壁部６を折り返して反転させることも可能である。

【００２９】また、側壁部６の折返しが円滑になされるように、図７～図９に示すカートリッジ１Ｂのように、本体部２Ｂの側壁部６Ｂの高さ方向の途中部に環状段部２５を設け、環状段部２５よりも上側の上側壁部２６の直径を、環状段部２５よりも下側の下側壁部２７の直径より大きく構成すると、環状段部２５を介して上側壁部２６を容易に折曲させることが可能となる。さらに環状段部２５と折り返す側の上側壁部２６とを環状段部２５の幅と略同じ半径の曲面Ｒ１で形成された円弧面状の案内面２８で滑らかに連設させると、上側壁部２６の折り返しがより一層容易になる。

【００３０】また、折り返す側の壁部、即ちカートリッジ１Ｂにおいては上側壁部２６に、折畳状態において外側へ突出する突条からなる縦リブ２９を、伸縮方向としての上下方向の略全長にわたって、円周方向に一定間隔おきに設け、上側壁部２６の内外面を反転させることに起因するシワの発生を縦リブ２９で吸収してもよい。

【００３１】更に、図１０～図１２に示すカートリッジ１Ｃのように、側壁部６Ｃの高さ方向の途中部に環状段部２５Ｃを形成し、側壁部６Ｃのうちの環状壁部２５Ｃよりも上側に上側壁部２６Ｃを形成し、下側に上側壁部２６Ｃよりも小径の下側壁部２７Ｃを形成して、環状段部２５Ｃを中心に下側壁部２７Ｃを上側壁部２６Ｃの内側に折り返して反転させ、カートリッジ１Ｃを折り畳むことも可能である。また、この場合には、環状段部２５Ｃと反転させる下側壁部２７Ｃとを環状段部２５Ｃの幅と略同じ半径の曲面Ｒ２で形成された円弧面状の案内面２８Ｃで滑らかに連設させると、下側壁部２７Ｃの折り返しがより一層容易になる。更に、下側壁部２７Ｃと載置部１０間に折り畳んだ状態で載置部１０の外周部から上方へ突出する高さの低い突出壁部３０を形成し、この突出壁部３０と載置部１０とにわたって断面三角形状のリブ部３１を円周方向に一定間隔おきに形成してもよい。この場合には、カートリッジ１Ｃを使用状態に切り換えたときに、隣接するリブ部３１間が略直角状に残った状態となり、載置部１０の外縁部に角部３２が形成されて、載置部１０が平坦になるので、カートリッジ１Ｃをコーヒーカップ等に対して安定性よく載せることが可能となる。

【００３２】次いで、ドリップ用カートリッジ１の製造方法について説明する。図１に示すドリップ用カートリッジ１は、予め、抽出口１１になる抜き穴５１を設けたポリプロピレン、ポリエステル等の熱可塑性合成樹脂シート５０と、フィルターとしての機能を持った成形性を有する不織布シート５２とをラミネートした材料シート５４をシート成形して製作したものである。

【００３３】先ず、図１３に示すように、帯状の熱可塑性合成樹脂シート５０に対してカートリッジ１の抽出口１１となる抜き穴５１を図１５に示す成形装置６０の成形型６１の型配置に対応させて行列状に形成するとともに、熱可塑性合成樹脂シート５０の側部に１ショット毎に１ヶ所の割合で、成形時の位置検出用の小孔５３を形成する。但し、１つの抽出口１１を複数の抜き穴５１で構成することも可能である。また位置検出用の小孔５３は抜き穴５１と一体で抜き加工しても良いし、小孔５３の代わりに樹脂シート５０に位置検出用マークを印刷し、光電管等で位置合わせをしながら所定の位置に抜き穴５１を抜き加工しても良い。

【００３４】次に、図１３，図１４に示すように、抜き穴５１及び小孔５３を形成した熱可塑性合成樹脂シート５０に対して、熱可塑性合成樹脂材料からなる長繊維スパンボンド不織布等の成形性を有する不織布シート５２を、抜き穴５１を覆うように熱ラミネートして、材料シート５４を製作する。

【００３５】次に、不織布シート５２が下側に位置するように、材料シート５４を成形装置６０へ供給し、抜き穴５１が、成形されたカートリッジ１の底面略中央に位置するように、位置検出用の小孔５３を光電管等の検出手段６２で検出し、材料シート５４を位置調整するとともに、材料シート５４をヒータ６３で加熱してから、マッチモールド型からなる上下の成形型６１間で熱プレス成形する。

【００３６】次に、熱プレス成形した材料シート５４を図外の打ち抜き手段でトリミングして、単体の本体部２を製作する。

【００３７】次に、図示外の充填装置により本体部２の収容部３内に一定量の焙煎コーヒー粉末４を充填してから、収容部３の開口が閉塞されるように通水性を有する不織布シートからなる封止シート５を載置部１０の上面にヒートシールや超音波シールなどで接着し、カートリッジ１を得ることになる。

【００３８】この製造方法では、予め用意した材料シート５４を成形することにより、フィルター機能を持った状態で抽出口１１が一体成形されるため、別工程での抽出口１１の穴抜き加工や、フィルター部材の接着加工を行う必要が無く、前記成形装置６０に焙煎コーヒー粉末４の充填装置を連結し、インラインでコーヒーの充填加工と封止シート５の接着加工が可能となり、大幅に生産性を向上することが可能となる。

【００３９】

【発明の効果】本発明に係るドリップ用カートリッジによれば、お湯を溜める本体部と抽出口のフィルター部材を一体成形できるので、別工程で底面に抽出用の穴をあけたり、フィルター部材を接着したりする必要が無く、低コストで製造できるため、使い捨て仕様として好適に

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提供できる。また、別の成形容器等の他の器具を必要としないため、アウトドア等にも手軽に携行でき利便性が高い。

【００４０】カートリッジの側壁部の上側壁部又は下側壁部を高さ方向の途中部で折り返して反転させ、上側壁部の内側に下側壁部を配置させて全高を低く設定すると、個包装にしたときの容積を半減することができ、流通段階でのコストを大幅に抑制することができる。また、かさばらずアウトドア等への携行もしやすくなって利便性が高まる。

【００４１】カートリッジの側壁部の高さ方向の途中部に環状段部を形成し、環状段部と上側壁部とを円弧面で滑らかに連設させると、この環状段部と上側壁部の連設部分が屈曲し易くなり、側壁部の折り返しが容易になって、作業性を高めることができる。

【００４２】反転させる上側壁部又は下側壁部に伸縮方向に延びる縦リブを円周方向に間隔をあけて形成すると円周方向に若干の伸縮性が生じ、円周の小さい側壁部内面が、円周の大きい側壁部外面と入れ替わることによって生じるシワを効果的に解消することができる。また、壁部の融通がきくため、反転した壁面を使用時に戻す際にも簡単に操作できる。

【００４３】本発明に係るドリップ用カートリッジの製造方法によれば、お湯を溜める本体部とフィルター機能を持つ抽出口を、同時に、一体形成できるため、後加工で抽出口となる穴を抜いたり、フィルター部材を接着する必要が無く、安価にフィルター付きのドリップ用カートリッジを製造できる。また、材料シートの状態から、フィルター機能を持った容器の状態までを一貫して製造できるため、一般の成形装置付き自動充填シール機を用いると、最終製品までインラインで一貫加工が可能になり、生産性の向上ができる。

【図面の簡単な説明】

【図１】　ドリップ用カートリッジの斜視図

【図２】　同ドリップ用カートリッジの縦断面図

【図３】　同ドリップ用カートリッジの本体部の平面図

【図４】　他の構成のドリップ用フィルターの斜視図

【図５】　同ドリップ用フィルターの縦断面図

【図６】　（ａ）（ｂ）はカートリッジの折返し方法の説明図

【図７】　他の構成のドリップ用カートリッジの斜視図

【図８】　同ドリップ用カートリッジの使用状態での縦断面図

【図９】　同ドリップ用カートリッジの折畳状態での縦断面図

【図１０】　他の構成のドリップ用カートリッジの焙煎コーヒー粉末及び封止シートを除去した状態での使用状態の縦断面図

【図１１】　同ドリップ用カートリッジの焙煎コーヒー粉末及び封止シートを除去した状態での折畳状態の縦断面図

【図１２】　同ドリップ用カートリッジの焙煎コーヒー粉末及び封止シートを除去した状態での平面図

【図１３】　材料シートの製造方法の説明図

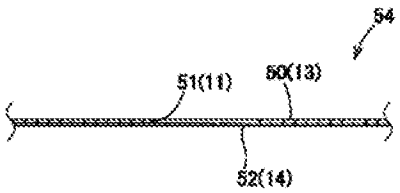
【図１４】　材料シートの縦断面図

【図１５】　製造装置の概略説明図

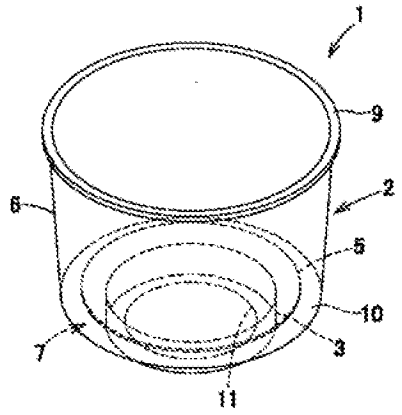
【符号の説明】

１	ドリップ用カートリッジ		
２	本体部	３	収容部
４	焙煎コーヒー粉末	５	封止シート
６	側壁部	７	底壁部
９	フランジ部	１０	載置部
１１	抽出口	１２	フィルター
１３	基材層	１４	不織布層
１Ａ	カートリッジ	１５	位置規制部
２０	受け台	２１	折り返し治具
１Ｂ	カートリッジ	２Ｂ	本体部
６Ｂ	側壁部	２５	環状段部
２６	上側壁部	２７	下側壁部
２８	案内面	２９	縦リブ
１Ｃ	カートリッジ	６Ｃ	側壁部
２５Ｃ	環状段部	２６Ｃ	上側壁部
２７Ｃ	下側壁部	２８Ｃ	案内面
３０	突出壁部	３１	リブ部
３２	角部		
５０	熱可塑性合成樹脂シート		
５１	抜き穴	５２	不織布シート
５３	小孔	５４	材料シート
６０	成形装置	６１	成形型
６２	検出手段	６３	ヒータ

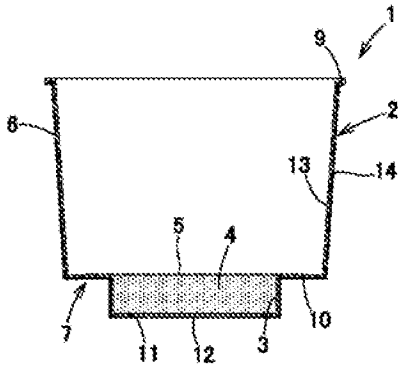
【図１４】



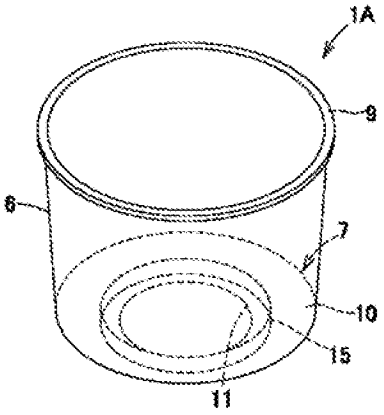
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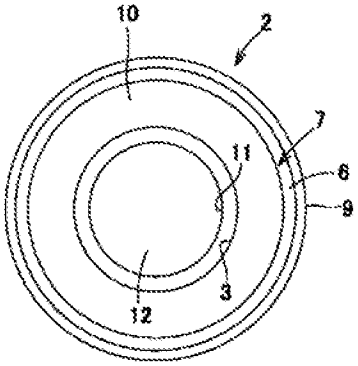
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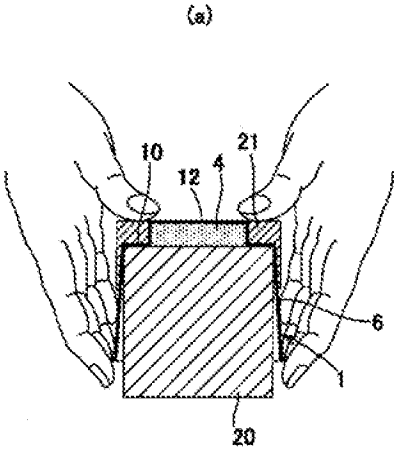
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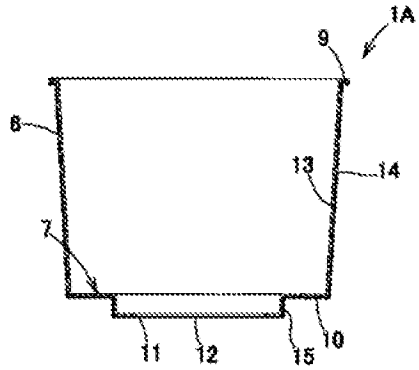
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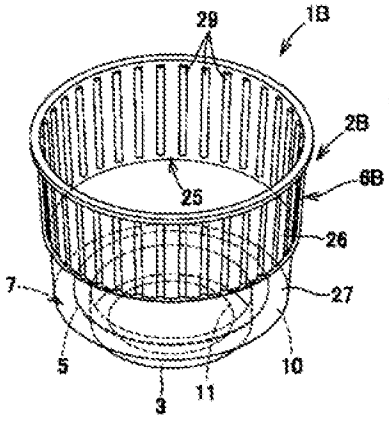
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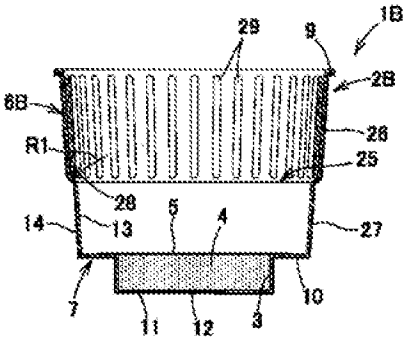
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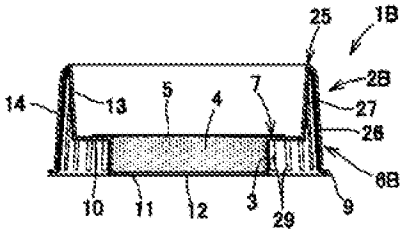
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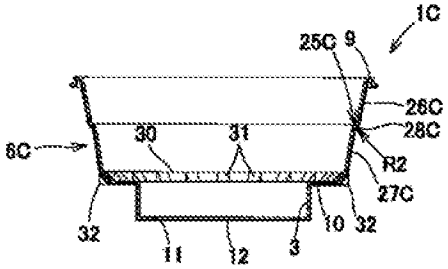
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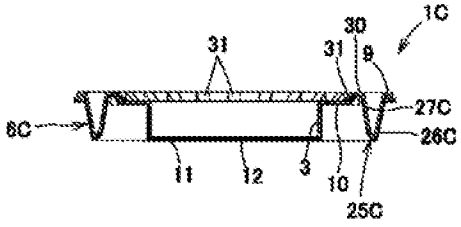
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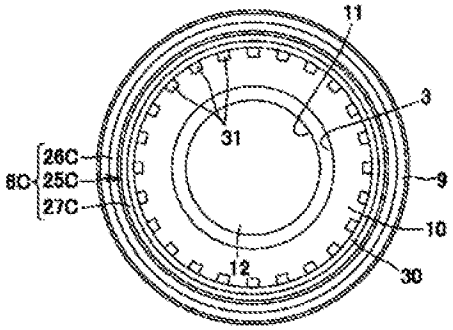
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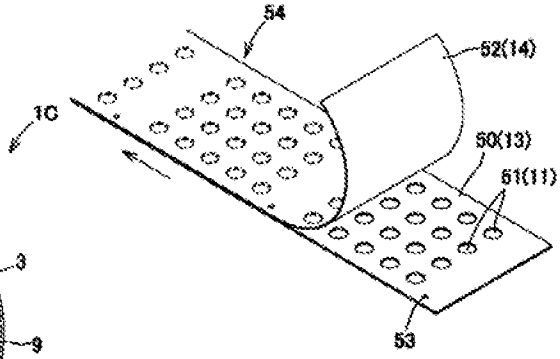
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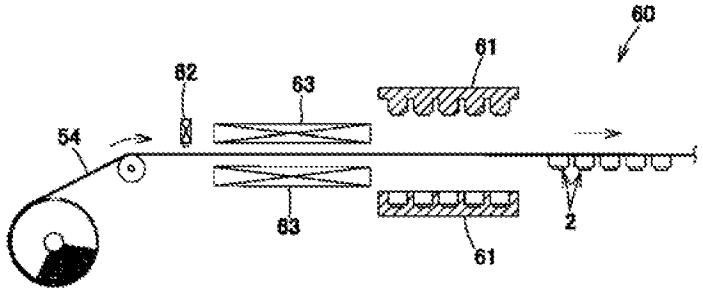
【図12】



【図13】



【図15】



Espacenet

Bibliographic data: JP2003235733 (A) — 2003-08-26

DRIPPING CARTRIDGE

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Applicant(s): KASHIWAGI MOLD KK ± (KASHIWAGI MOLD:KK)

Classification: **- international:** ***A47J31/02; A47J31/06; B65D81/34;*** (IPC1-7): A47J31/02; A47J31/06; B65D81/34

- cooperative:

Application number: JP20020045303 20020221

Priority number(s): JP20020045303 20020221

Also published as: JP3962861 (B2)

Abstract of JP2003235733 (A)

PROBLEM TO BE SOLVED: To provide a dripping cartridge which can be prepared cheaply, is disposable, can reduce its packed volume, can reduce the shipping cost and can improve the portability. ;SOLUTION: This dripping cartridge has a cartridge-shaped base material layer 13 which is made of a thermoplastic synthetic resin material and has an extraction hole 11 at the bottom and a nonwoven fabric layer 14 which is made of a thermoplastic synthetic resin material and is laminated wholly on the inside or outside of the base material layer 13 to cover the extraction hole 11 and constitute a filter 12 in the extraction hole 11. This dripping cartridge is prepared by laminating a nonwoven sheet made of a thermoplastic synthetic resin material having a filter function wholly on at least one side of a bored thermoplastic synthetic resin sheet and then subjecting this laminated material sheet to a sheet-forming operation to form it into a cartridge shape having an extraction hole at the bore. ;COPYRIGHT: (C)2003,JPO

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DESCRIPTION JP2003235733

[0001]

BACKGROUND OF THE INVENTION 1. Field of the Invention The present invention relates to a drip cartridge which can be suitably used as a disposable simple coffee drip and a method of manufacturing the same.

[0002]

2. Description of the Related Art As a drip filter for roasted coffee, one using a non-woven bag-like filter or a paper filter attached to a funnel-shaped dedicated device is widely used. In addition, products using a cartridge made by sealing roasted coffee powder in a non-woven container attached to the bottom of a dedicated device and used, and a disposable integrated cartridge in which a main part of a water resistant paper and a filter are combined are launched. ing. Among these, those using special purpose devices are disposable filters and cartridges, but special purpose devices must be washed each time they are used, and special purpose devices may be bulky, especially for outdoor use etc. There was a point lacking. Further, the water resistant paper cartridge has a problem that the manufacturing cost is high because the structure is complicated and the number of processing steps is large.

[0003]

In general, when making an integral drip filter in which a main body portion and a filter portion are integrated, a cup-shaped main body portion having an extraction port formed on the bottom surface is manufactured. A method is used in which a non-woven fabric or filter paper acting as a filter is adhered to the bottom of the main body to close the extraction port. Also in the cartridge in which the roasted coffee is enclosed, the non-woven container serving as a filter function containing roasted coffee powder, and the main body for storing hot water and flowing it to the filter are separate members which can be detached as described above. In many cases, both are adhered to each other by construction or post processing.

[0004]

The applicant considers that this is one of the factors that hinders the cost reduction and the convenience improvement of the cartridge and filter for drips, and integrally molding the main body for storing hot water and the filter portion for extraction. It was considered that it is possible to provide a disposable filter cartridge with a drip filter, which has high convenience and productivity and can be manufactured inexpensively.

[0005]

In addition, in the conventional drip cartridge, when the individual packaging such as the pillow packaging is individually done to enhance the convenience, the volume occupied by the main body for storing the hot water of one extraction volume is large and bulky, and the transportation and storage There is a problem that the efficiency is significantly reduced.

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[0006]

It is an object of the present invention to provide a drip cartridge which can be manufactured at low cost and can be disposable, and in which the volume of packaging can be reduced to reduce the distribution cost and improve the convenience at the time of carrying. is there.

[0007]

A cartridge for drips according to the present invention is made of a thermoplastic synthetic resin material, and has a cartridge-shaped base layer having an extraction port formed on the bottom surface, and a plug for closing the extraction port. And a non-woven fabric layer made of a thermoplastic synthetic resin material which is laminated on the entire outer surface or inner surface of the base material layer and which constitutes a filter in the extraction port.

[0008]

This cartridge can be manufactured by the manufacturing method as described in claim 6.

That is, a non-woven fabric sheet having a filter function made of a thermoplastic synthetic resin material is laminated over the entire surface on at least one surface of the thermoplastic synthetic resin sheet previously punched out, and the laminated material sheet is used as the perforated hole. Can be manufactured by sheet-forming into a cartridge shape so that it becomes an extraction port.

[0009]

More specifically, this cartridge can be manufactured by heat press molding using a match mold type, and for thermoplastic synthetic resin sheets such as polypropylene, polyester, etc., corresponding to the mold arrangement of the molding apparatus, for drips A sheet of material made of a thermoplastic synthetic resin material and laminated with a non-woven sheet having a filter function is provided so as to provide one or more extraction holes functioning as an extraction port when molded into a cartridge and cover the extraction holes. Forming the filter part and the main body part at the same time while detecting the position of the extraction hole so that the extraction hole is formed on the bottom surface of the drip cartridge when molded Can be produced.

Therefore, in this cartridge, at the stage of producing the material sheet, the thermoplastic synthetic resin sheet is provided with a punching hole, and a non-woven sheet serving as a filter is laminated and integrally formed into a separate process. Thus, it is possible to manufacture a drip cartridge container inexpensively and efficiently without the need for extraction processing of the extraction port and adhesion of a filter.

[0010]

Here, the storage portion is recessed in the central portion of the bottom surface of the cartridge, the storage portion is filled with the roasted coffee powder, and the bottom surface of the cartridge is sealed with the roasted coffee powder in the storage portion. The sealing sheet which consists of a nonwoven fabric which has may be stuck.

By this configuration, a drip cartridge containing roasted coffee can be easily and inexpensively manufactured.

Also, with this cartridge, there is no need for post processing such as punching out the extraction port or bonding the lower filter, so that it is possible to perform consistent processing up to the final product with a general automatic filling line with a molding machine it becomes.

[0011]

The cartridge is made of a flexible and bendable thermoplastic synthetic resin sheet, and the upper side wall or lower side wall of the side wall is folded back at an intermediate portion in the height direction and inverted, and the lower side of the upper side wall The sidewall may be arranged to set the overall height low. In this case, the cartridge can be folded at the time of storage, etc. to reduce the height of the side wall to about half, and volume reduction can be achieved at the time of handling, and the upper side wall or lower side wall folded back and inverted at the time of use it can be easily used by stretching it to its original shape. In addition, even if individual packaging such as pillow packaging is carried out one by one, the volume can be reduced, so that the transportation cost can be reduced.

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[0012]

An annular step is formed in the middle in the height direction of the side wall of the cartridge, and the annular step and the wall to be reversed are smoothly connected in a circular arc surface, and the upper side wall or the bottom around the annular step The side wall may be folded back and inverted, and the lower side wall may be disposed inside the upper side wall to set the total height low. When such an annular step portion is formed, the side wall surface can be folded back relatively easily around the annular step portion, and the distortion of the outer periphery when folded back can also be reduced. In addition, the position of the folded back portion is stabilized, and it becomes possible to fold back at the same height.

[0013]

Longitudinal ribs extending in the expansion and contraction direction may be formed circumferentially at intervals in the upper and lower side wall portions to be reversed. That is, in the wall portion to be reversed, since the short inner diameter side of the circumference at the time of molding is disposed on the large outer diameter side of the circumference by the reverse, wrinkles are easily generated on the wall portion by the reverse. By providing a longitudinal rib extending in the expansion and contraction direction on the wall to be inverted, the wall to be inverted is given some stretchability with respect to the circumferential direction to absorb wrinkles generated at the time of inversion, and the wall It is possible to improve the appearance of the cartridge in the state where the part is inverted. In addition, it is possible to more easily return the inverted wall surface during use. The same effect can be obtained even if the wall portion to be reversed is formed into a wave shape which is radially oscillated along the circumferential direction.

[0014]

In the method of manufacturing a drip cartridge according to the present invention, a non-woven sheet having a filter function made of a thermoplastic synthetic resin material is laminated over the entire surface on at least one surface of the thermoplastic synthetic resin sheet having a predrilled hole. The laminated material sheet is sheet-formed into a cartridge shape so that the extraction hole is an extraction port.

[0015]

In this manufacturing method, since the filter can be integrally formed, it is not necessary to perform the punching process of the extraction port and the adhesion process of the filter to the bottom in a separate step, and the manufacturing cost of the cartridge can be reduced.

In particular, in the case of a cartridge for filling roasted coffee, it is possible to consistently process into the final product by using a general automatic filling machine with a forming device.

[0016]

BEST MODE FOR CARRYING OUT THE INVENTION Embodiments of the present invention will be described below with reference to the drawings. As shown in FIGS. 1 to 3, the drip cartridge 1 has a cup-shaped main body 2 and a roasted coffee powder 4 filled in a container 3 formed at the bottom of the main body 2, and the bottom of the main body 2. And a sealing sheet 5 for sealing the roasted coffee powder 4 in the container 3.

[0017]

When the main body 2 is described, the main body 2 has a side wall 6 and a bottom wall 7 whose diameter increases toward the upper side, and a reinforcing flange 9 is folded at the upper end of the side wall 6 A substantially flat annular mounting portion 10 for setting the cartridge 1 on the upper side of a coffee cup or the like is formed on the outer peripheral portion of the bottom wall portion 7. The housing portion 3 is recessed at a substantially central portion of the bottom wall portion 7, the extraction port 11 is formed on the bottom surface of the housing portion 3, and the extraction port 11 is a filter 12 made of a non-woven sheet so as to close the opening. It is stretched. Then, the necessary amount of roasted coffee powder 4 is filled in the housing portion 3 of the main body portion 2 and the sealing sheet 5 made of non-woven fabric is heated to the upper surface of the mounting portion 10 so as to close the top opening of the housing portion 3 It adheres by a seal etc. and cartridge 1 will be manufactured. The extraction port 11 may be circular or polygonal. Moreover, you may comprise by several holes, such as slit shape, fan shape, and a small hole.

[0018]

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The main body portion 2 is laminated on the entire surface of the outer surface of the base material layer 13 so as to close the extraction port 11 and the cartridge-shaped base material layer 13 made of thermoplastic synthetic resin material or the like. The two-layer structure with the non-woven fabric layer 14 made of thermoplastic synthetic resin material that constitutes the filter 12, and as described later, the synthetic resin sheet 50 that constitutes the base material layer 13 corresponds to the extraction port 11 and the extraction hole A non-woven fabric sheet 52 constituting the non-woven fabric layer 14 is laminated to this, and the laminated material sheet 54 is hot-pressed and formed into a cartridge shape. However, the non-woven fabric layer 14 may be laminated over the entire inner surface of the base material layer 13. In addition, a decorative hole or the like may be formed in the nonwoven fabric layer 14 at a position corresponding to the base material layer 13.

[0019]

As the thermoplastic synthetic resin constituting the base material layer 13, polyolefin-based synthetic resin materials such as polypropylene and polyethylene, those obtained by blending an inorganic filler with these synthetic resin materials, polyester, polycarbonate and the like can be suitably used. .

[0020]

As the non-woven fabric constituting the non-woven fabric layer 14, a non-woven fabric made of a material having a formability such as a long fiber spunbonded non-woven fabric and excellent in heat fusion to the base material layer 13 can be suitably used.

Specifically, a long fiber spunbonded nonwoven fabric made of a thermoplastic synthetic resin material such as polyamide, polyacrylonitrile, polyester, polyvinyl alcohol, polypropylene, polyvinyl chloride or polyvinylidene chloride can be employed. Also, the basis weight of the non-woven fabric (non-woven fabric sheet 52) constituting the non-woven fabric layer 14 is set such that the hot water poured into the main body 2 is supplied into the coffee cup through the roasted coffee powder 4 at an appropriate speed. It will be done. The sealing sheet 5 is also made of the same material as the non-woven fabric layer 14.

[0021]

The main body portion 2 can be formed into any shape other than a cup shape. In addition, the capacity of the main unit 2 may be set to be slightly larger than the capacity of a standard coffee cup, and by pouring hot water to the setting position of the main unit 2, it may be possible to put a cup of coffee in order to set the height of the main body 2 as low as possible, the capacity may be set smaller than the capacity of a standard coffee cup, and hot water may be poured a plurality of times.

[0022]

The cartridge 1 is basically a simple disposable cartridge, and the container 3 is filled with roasted coffee powder 4 in an amount capable of containing one cup of coffee. However, it is also possible to fill it with a quantity of roasted coffee powder 4 capable of containing multiple cups of coffee.

[0023]

When the cartridge 1 is used, the cartridge 1 is set on a container such as a coffee cup and the hot water is poured into the main body 2 and the poured hot water is supplied to the roasted coffee powder 4 through the sealing sheet 5. , Together with the extracted coffee, will be supplied through the filter 12 into the container.

[0024]

In the present embodiment, the roasted coffee powder 4 is filled in the storage unit 3, but it may be configured to be filled with tea leaves such as green tea, oolong tea and black tea to provide green tea, oolong tea, black tea and the like. It is possible.

[0025]

Further, in the present embodiment, the roasted coffee powder 4 is provided in the cartridge 1, but the roasted coffee powder 4 and the sealing sheet 5 are omitted, and the roasted coffee powder 4 separately prepared is provided in the main body 2 and it is also possible to put in and extract coffee.

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Further, in this case, as with the cartridge 1A shown in FIGS. 4 and 5, the storage portion 3 of the main body portion 2 in the above embodiment is replaced with a deeper portion than the storage portion 3 for positioning the cartridge 1 with respect to the coffee cup. The position restricting portion 15 having a small depth is recessed in the central portion of the bottom wall portion 7 or the housing portion 3 is completely omitted, and the extraction port 11 is directly formed in the central portion of the bottom wall portion 7 It will be.

[0026]

The cartridge 1 is provided in the market by being packaged with a barrier film or the like having gas barrier properties in order to maintain the flavor of coffee.

If multiple packages are used and opened up and used up in a short period of time, the flavor will be lost if left untouched, so preservation of the remaining items may be considered such as using cans, glass bottles or sealed storage bags made of barrier film etc. is required. It is preferable that the packaging form be individually packaged one by one so that no special consideration is required and the portable form can be easily carried and used outdoors. However, if the cartridge 1 is individually packaged once in pillow packaging etc., the main body 2 for storing hot water is bulky, the distribution cost and the sales cost are high, and it is inconvenient to carry and the convenience is lost remarkably. In order to solve the above-mentioned problem, the present applicant reduces the volume of the packaging form by folding and inverting the side wall 6 of the main body 2 at a midway portion in the height direction to make the height of the cartridge 1 about half. Tried to make the following method.

[0027]

In order to be able to turn over and reverse the upper or lower side wall portion of the side wall portion 6 of the main body portion 2 in the middle in the height direction, polyethylene, polypropylene, and inorganic fillers of these polyolefin synthetic resins are used as the base material layer 13 A thermoplastic synthetic resin sheet having a relatively flexible and bendable property, such as one containing a mixture of

[0028]

Then, as shown in FIG. 6A, the cartridge 1 is inverted and mounted on the substantially cylindrical receiving base 20, and the ring-shaped folding jig 21 fitted to the lower half of the cartridge 1 is inverted. Cover the set cartridge 1 from the upper side, pull up the opening edge of the cartridge 1 so that the edge of the cartridge 1 is spread outward while pressing down the mounting portion 10 of the cartridge 1 with the folding jig 21 and reverse the upper half of the cartridge 1 As shown in 6 (b), the side wall 6 is folded back until the side wall 6 hits the lower end of the folding jig 21 so that the height of the cartridge 1 is about half as formed, and individually packaged in this state So, it became possible to reduce the volume in the packaging state.

When the cartridge 1 is in use, the lower surface side of the rim of the folded cartridge 1 is held with the fingertips of both hands, and the mounting portion 10 is pressed down with the thumb from the inside to make the body portion 2 in a molding state. It will be restored. However, it is also possible to mechanically fold back the side wall 6 in the same manner as described above.

[0029]

Further, as in the cartridge 1B shown in FIGS. 7 to 9, an annular step 25 is provided in the middle of the side wall 6B of the main body 2B in the height direction so that the side wall 6 can be smoothly folded back. If the diameter of the upper side wall 26 on the upper side of the annular step 25 is larger than the diameter of the lower side wall 27 on the lower side of the annular step 25, the upper side wall 26 can be easily made through the annular step 25. It becomes possible to make it bend. Further, when the annular step portion 25 and the upper side wall portion 26 on the side to be folded back are smoothly connected by the arc-shaped guide surface 28 formed by the curved surface R1 having substantially the same radius as the width of the annular step portion 25, the upper side wall portion The folding of 26 becomes even easier.

[0030]

Further, in the folded side wall portion, that is, the upper side wall portion 26 in the cartridge 1B, a longitudinal rib 29 formed of a projecting strip protruding outward in the folded state is circumferentially extended over substantially the entire length in the vertical direction as the expansion and contraction direction. The vertical ribs 29 may absorb the occurrence of wrinkles caused by inverting the inner and outer surfaces of the upper side wall 26 at regular intervals.

[0031]

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Furthermore, as in the cartridge 1C shown in FIGS. 10 to 12, an annular step 25C is formed in the middle in the height direction of the side wall 6C, and the upper side wall is above the annular wall 25C of the side wall 6C. Forming a portion 26C, forming a lower side wall 27C having a smaller diameter than the upper side wall 26C at the lower side, folding back the lower side wall 27C to the inside of the upper side wall 26C centering on the annular step 25C; It is also possible to fold the cartridge 1C.

Further, in this case, the annular step portion 25C and the lower side wall portion 27C to be inverted are smoothly provided continuously by the arc-shaped guide surface 28C formed by the curved surface R2 having a radius substantially the same as the width of the annular step portion 25C. And, the folding back of the lower side wall portion 27C becomes even easier. Further, a projecting wall portion 30 having a low height which protrudes upward from the outer peripheral portion of the mounting portion 10 in a folded state between the lower side wall portion 27C and the mounting portion 10 is formed, and the protruding wall portion 30 and the mounting portion The rib portions 31 having a triangular cross section may be formed at regular intervals in the circumferential direction. In this case, when the cartridge 1C is switched to the use state, the space between the adjacent rib portions 31 remains substantially at a right angle, and the corner portion 32 is formed at the outer edge portion of the mounting portion 10 Since the portion 10 is flat, the cartridge 1C can be stably placed on a coffee cup or the like.

[0032]

Next, a method of manufacturing the drip cartridge 1 will be described. The drip cartridge 1 shown in FIG. 1 is made of a thermoplastic synthetic resin sheet 50 made of polypropylene, polyester or the like and provided with a hole 51 to be the extraction port 11 in advance, and a non-woven sheet 52 having a formability having a function as a filter. And a sheet of material 54 formed by laminating.

[0033]

First, as shown in FIG. 13, the punched holes 51 to be the extraction port 11 of the cartridge 1 are made to correspond to the mold arrangement of the molding die 61 of the molding apparatus 60 shown in FIG. While forming in a matrix shape, small holes 53 for position detection at the time of molding are formed on the side of the thermoplastic synthetic resin sheet 50 at a rate of one point for each shot. However, it is also possible to configure one extraction port 11 with a plurality of extraction holes 51. Also, the small holes 53 for position detection may be punched integrally with the punching holes 51, and instead of the small holes 53, a mark for position detection is printed on the resin sheet 50, and alignment is performed using a photocell etc. The punching hole 51 may be punched out at the position of.

[0034]

Next, as shown in FIG. 13 and FIG. 14, with respect to the thermoplastic synthetic resin sheet 50 in which the through holes 51 and the small holes 53 are formed, the formability of a long fiber spunbonded nonwoven fabric or the like made of a thermoplastic synthetic resin material is The non-woven fabric sheet 52 is thermally laminated to cover the punched holes 51 to produce a material sheet 54.

[0035]

Next, the material sheet 54 is supplied to the forming apparatus 60 so that the non-woven fabric sheet 52 is positioned on the lower side, and the position detection The small holes 53 are detected by the detection means 62 such as a phototube, and the position of the material sheet 54 is adjusted, and the material sheet 54 is heated by the heater 63 and then heat press-formed between upper and lower forming dies 61 of match mold type. Do.

[0036]

Next, the heat press-formed material sheet 54 is trimmed by a punching means (not shown) to produce a single main body 2.

[0037]

Next, after filling a certain amount of roasted coffee powder 4 into the storage part 3 of the main body 2 by a filling device not shown, from a non-woven sheet having water permeability so that the opening of the storage part 3 is closed. The sealing sheet 5 is adhered to the upper surface of the mounting portion 10 by heat sealing, ultrasonic sealing or the like to produce a cartridge 1.

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[0038]

In this manufacturing method, by forming the material sheet 54 prepared in advance, the extraction port 11 is integrally formed in a state having a filter function, and thus, the hole forming process of the extraction port 11 in a separate process, the filter member There is no need to perform adhesion processing, the filling device of roasted coffee powder 4 is connected to the forming device 60, filling processing of coffee and adhesion processing of the sealing sheet 6 become possible in line, and productivity is greatly improved. It becomes possible.

[0039]

According to the drip cartridge of the present invention, the filter member for storing the hot water and the filter member for the extraction port can be integrally formed, so that a hole for extraction is formed in the bottom in a separate step, or the filter member is adhered. Because it can be manufactured at low cost without needing to be carried out, it can be provided inexpensively as disposable specifications.

In addition, since it does not require another device such as another molded container, it can be easily carried outdoors and the convenience is high.

[0040]

When the upper side wall or lower side wall of the side wall of the cartridge is folded back at an intermediate part in the height direction and inverted to arrange the lower side wall inside the upper side wall and the overall height is set low, individual packaging The volume can be halved, and the cost at the distribution stage can be significantly reduced.

In addition, it is easy to carry to the outdoors without bulky and convenience is enhanced.

[0041]

An annular step is formed in the middle in the height direction of the side wall of the cartridge, and when the annular step and the upper side wall are smoothly connected in a circular arc, the continuous portion of the annular step and the upper side wall is provided. Can be bent easily, and the side wall can be easily folded back to improve workability.

[0042]

When longitudinal ribs extending in the expansion and contraction direction are formed at intervals in the circumferential direction on the upper and lower side wall portions to be reversed, some stretchability is generated in the circumferential direction, and the side wall portion having a small circumference has a circumferential it is possible to effectively eliminate the wrinkles caused by replacing the large side wall outer surface.

In addition, since the flexibility of the wall portion is sufficient, it is possible to easily operate the inverted wall when using it.

[0043]

According to the method for manufacturing a cartridge for drips according to the present invention, the main body for storing hot water and the extraction port having a filter function can be simultaneously formed integrally. There is no need to bond, and it is possible to manufacture a drip cartridge with filter at low cost.

In addition, since it is possible to manufacture consistently from the condition of the material sheet to the condition of the container with the filter function, using the automatic filling and sealing machine with a general forming device, it is possible to perform consistent processing in-line to the final product, Productivity can be improved.

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CLAIMS JP2003235733

1.

A cartridge-shaped base material layer made of a thermoplastic synthetic resin material and having an extraction port formed on the bottom, and the entire surface of the outer surface or the inner surface of the base layer so as to close the extraction port, constitutes a filter in the extraction port And a non-woven fabric layer made of a thermoplastic synthetic resin material.

2.

A storage portion is recessed in the central portion of the bottom surface of the cartridge, the storage portion is filled with roasted coffee powder, and the bottom surface of the cartridge is sealed with the roasted coffee powder in the storage portion. The drip cartridge according to claim 1, wherein the sealing sheet is attached.

3.

The cartridge is made of a flexible and bendable thermoplastic synthetic resin sheet, and the upper side wall or lower side wall of the side wall is folded back at an intermediate portion in the height direction and inverted, and the lower side of the upper side wall The drip cartridge according to claim 1 or 2, wherein the side wall portion is disposed to set the total height low.

4.

An annular step is formed in the middle in the height direction of the side wall of the cartridge, and the annular step and the wall to be reversed are smoothly connected in a circular arc surface, and the upper side wall or the bottom around the annular step The drip cartridge according to claim 1 or 2, wherein the side wall portion is folded back and inverted, and the lower side wall portion is disposed inside the upper side wall portion to set the total height low.

5.

5. The drip cartridge according to claim 3, wherein longitudinal ribs extending in the direction of expansion and contraction are formed circumferentially at intervals in the upper and lower side wall portions to be reversed.

6.

The non-woven fabric sheet having a filter function made of a thermoplastic synthetic resin material is laminated over the entire surface on at least one surface of the thermoplastic synthetic resin sheet previously punched out, and the laminated hole is used to extract the laminated material sheet. The manufacturing method of the cartridge for drips which sheet-forms in cartridge shape so that it may become a mouth.

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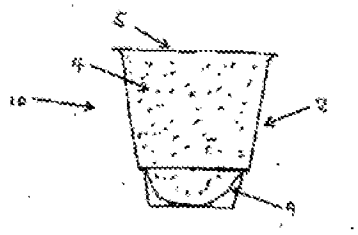
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Ｆターム(参考)　4B104 AA03　AA20　BA46　EA20　EA30

(54)【発明の名称】飲料フィルターカートリッジおよびそれを用いた飲料抽出容器

(57)【要約】　（修正有）
【課題】一杯抽出用の飲料抽出容器で用いる飲料フィルターカートリッジであって、抽出用の飲料抽出用の粉末を十分量封入可能であり、抽出時の目詰まりを抑制し、必要十分な抽出を行うことのできる飲料フィルターカートリッジを提供する。
【解決手段】飲料フィルターカートリッジ１０であって、底壁と、底壁から上方開口部を囲む円状縁まで延びる側壁とを有するカップ型容器と、半円状に賦型され、透水性を有するフィルター部３とを有し、前記カップ型容器の内壁に接し、かつ半円状凸部が下方に突出するように、フィルター部３が内挿され、さらに、カップ型容器内部には飲料抽出用の粉末４が封入され、カップ型容器の上方開口部には蓋材５が接着され、密閉構造とした。
【選択図】図３



【特許請求の範囲】
【請求項１】
飲料フィルターカートリッジであって、
底壁と，前記底壁から上方開口部を囲む円状縁まで延びる側壁とを有するカップ型容器と、
半円状に賦型され，透水性を有するフィルター部とを有し、
前記カップ型容器の内壁に接し、かつ半円状凸部が下方に突出するように、
前記フィルター部が内挿され、
さらに、前記カップ型容器内部には飲料抽出用の粉末が封入され、
前記カップ型容器の上方開口部には蓋材が接着され、
密閉構造とした飲料フィルターカートリッジ。
【請求項２】
前記フィルター部が、熱可塑性樹脂からなる不織布である請求項１記載の飲料フィルターカートリッジ。
【請求項３】
前記側壁および底壁が，熱可塑性樹脂からなる多層構造体である請求項１または２記載の飲料フィルターカートリッジ。
【請求項４】
前記フィルター部の上辺縁が，熱プレスされ枠状とされ、前記フィルター部の枠状が前記カップ型容器側壁と脱着可能な構造である請求項１～３いずれか記載の飲料フィルターカートリッジ。
【請求項５】
前記フィルター部上辺縁が、前記カップ型容器と一体成形された請求項１～３いずれか記載の飲料フィルターカートリッジ。
【請求項６】
前記フィルター部上辺縁が、前記カップ型容器と他樹脂を用いて接合された請求項１～３いずれか記載の飲料フィルターカートリッジ。
【請求項７】
請求項１～６記載の飲料フィルターカートリッジを装着して用いる飲料抽出装置。

【発明の詳細な説明】

【技術分野】
【０００１】
本発明は、一杯抽出用の飲料抽出容器で用いる飲料フィルターカートリッジに関する。
【背景技術】
【０００２】
コーヒー、紅茶、緑茶等の嗜好品は、これらを粉末状にしたものを飲料用抽出フィルターに収容して、飲料用抽出装置の所定位置にセットされ、上部から注湯することで、ホットコーヒー、ホット紅茶などを作ることができる。飲料用抽出フィルターがセットされる飲料用抽出装置は、主として業務用に使用されるものであるが、家庭用でも使用可能な小型化されたものも普及している。
【０００３】
例えば、特許文献１には、上記飲料用抽出装置で用いる飲料フィルターカートリッジが開示されている。このような飲料フィルターカートリッジでは、樹脂製の容器により形成され、この容器の内部にフィルター部が収容されたりている。容器の上部は蓋部により封止されている。蓋部はフィルム製のシートにより形成される。
【０００４】
コーヒー等を抽出するときは、カートリッジ上部の蓋部から注湯用針を貫通させて、あるいは、上部の蓋部から直接、お湯を注ぎこむ。また、カートリッジ底部から抽出用針が貫通させられる。これにより、カートリッジから嗜好品が抽出されて、カートリッジの下部に載置されているコーヒーカップ等に注ぐことができる。
【先行技術文献】
【特許文献】
【０００５】
【特許文献１】特許第３７４２３４４号公報
【発明の概要】
【発明が解決しようとする課題】
【０００６】
本発明者は、以下のようなことを見出した。
上記のような構造を有する飲料フィルターカートリッジを用いた場合、まず、樹脂製容器の内容積に対し、収容するフィルター部は相対的に内容積が小さいものとなり、したがって、フィルターには飲料抽出用の粉末を十分量封入することができない制約があった。また、樹脂製容器とフィルター部が完全には一体化されていないため、飲料抽出工程において、抽出初期にあってはフィルター効果が十分であるが、抽出が進むにしたがって、飲料抽出用の粉末がフィルター目詰まりを起こし、フィルター効果が低下するばかりか、必要十分な抽出ができないことがある。
本発明は、一杯抽出用の飲料抽出容器で用いる飲料フィルターカートリッジであって、抽出用の飲料抽出用の粉末を十分量封入可能であり、抽出時の目詰まりを抑制し、必要十分な抽出を行うことのできる飲料フィルターカートリッジを提供することを目的とする。
【課題を解決するための手段】
【０００７】
本発明者らは、前記課題を解決するため鋭意研究を重ねた結果、本発明に到達した。
すなわち、本発明の要旨は下記の通りである。
（１）飲料フィルターカートリッジであって、
底壁と、前記底壁から上方開口部を囲む円状縁まで延びる側壁とを有するカップ型容器と、
半円状に賦型され、透水性を有するフィルター部とを有し、
前記カップ型容器の内壁に接し、かつ半円状凸部が下方に突出するように、
前記フィルター部が内挿され、
さらに、前記カップ型容器内部には飲料抽出用の粉末が封入され、
前記カップ型容器の上方開口部には蓋材が接着され、

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密閉構造とした飲料フィルターカートリッジ。
（２）前記フィルター部が、熱可塑性樹脂からなる不織布である（１）の飲料フィルターカートリッジ。
（３）前記側壁および底壁が、熱可塑性樹脂からなる多層構造体である（１）または（２）の飲料フィルターカートリッジ。
（４）前記フィルター部の上辺縁が、熱プレスされ枠状とされ、前記フィルター部の枠状が前記カップ型容器側壁と脱着可能な構造である（１）～（３）の飲料フィルターカートリッジ。
（５）前記フィルター部上辺縁が、前記カップ型容器と一体成形された（１）～（３）の飲料フィルターカートリッジ。
（６）前記フィルター部上辺縁が、前記カップ型容器と他樹脂を用いて接合された（１）～（３）の飲料フィルターカートリッジ。
（７）（１）～（６）の飲料フィルターカートリッジを装着して用いる飲料抽出装置。
【発明の効果】
【０００８】
本発明によれば、一杯抽出用の飲料抽出容器で用いる飲料フィルターカートリッジであって、抽出用の飲料抽出用の粉末を十分量封入可能であり、抽出時の目詰まりを抑制し、必要十分な抽出を行うことのできる飲料フィルターカートリッジが得られる。このような飲料フィルターカートリッジを用いた飲料抽出容器は、抽出量を増やしながらも、抽出能力の低下を抑制した使用が可能である。
【図面の簡単な説明】
【０００９】
【図１】従来技術の実施の形態を示す飲料フィルターカートリッジの断面図である。
【図２】従来技術の飲料フィルターカートリッジにおける飲料抽出の形態を示す断面図である。
【図３】本発明における実施の形態を示す飲料フィルターカートリッジの断面図である。
【図４】本発明の飲料フィルターカートリッジにおける底壁の斜視図である。
【図５】本発明における実施の形態を示す飲料フィルターカートリッジの断面図である。
【図６】本発明の飲料フィルターカートリッジにおける底壁（枠有り）と側壁の態様を示す断面図である。
【図７】本発明の飲料フィルターカートリッジにおける底壁（枠有り）の斜視図である。
【図８】本発明の飲料フィルターカートリッジにおける底壁（枠有り）と側壁（固定用凸有り）の態様を示す断面図である。
【図９】本発明における実施の形態を示す飲料フィルターカートリッジの構造を示す断面図である。
【発明を実施するための形態】
【００１０】
以下、本発明を詳細に説明する。
本発明の飲料フィルターカートリッジは、底壁と、前記底壁から上方開口部を囲む円状縁まで延びる側壁とを有するカップ型容器と、半円状に賦型され、透水性を有するフィルター部とを有し、前記カップ型容器の内壁に接し、かつ半円状凸部が下方に突出するように、前記フィルター部が内挿され、さらに、前記カップ型容器内部には飲料抽出用の粉末が封入され、前記カップ型容器の上方開口部には蓋材が接着された密閉構造であることを特徴とする。
【００１１】
フィルター部を構成する材料としては、透水性を有するものであれば特に限定されない。透水性を有する材料としては、例えば、紙、織布、不織布等が挙げられ、織布、不織布を用いる場合は、天然繊維、合成繊維から選ばれる。天然繊維としては、綿、羊毛、各種植物繊維が挙げられ、合成繊維としては、ナイロン、ポリエステル、ポリプロピレン、ポリエチレン等の熱可塑性樹脂の単独重合体、共重合体または混合物が挙げられる。

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得られた織布、不織布の異なる種類、目付のものを用途に応じて組み合わせて用いることもできる。本発明においては、各種熱可塑性樹脂からなる不織布を好適に用いることができる。特に、食品用においては、抽出時の耐熱性、機械的強度のバランスに優れるため、ポリエステル、ポリプロピレンが好ましい。賦形を可能とするためには、目付は小さい方が好ましく、フィルター効果を高めるためにはメルトブロウン法により得られる不織布を用いることが特に好ましい。

【００１２】

側壁および底壁を構成する材料としては、特に制限はないが、カップ容器としての成形性、底壁との接着、または溶着適性に優れたものとするため、各種熱可塑性樹脂を用いることができる。熱可塑性樹脂としては、ナイロン、ポリエステル、ポリプロピレン、ポリエチレン、ポリスチレン、エチレン－ビニルアルコール共重合体のケン化物等が挙げられ、成形性を考慮すると、ポリエステル、ポリプロピレン、ポリエチレン、ポリスチレン、エチレン－ビニルアルコール共重合体のケン化物等が好ましい。また、これらは２種以上を組合わせて、アロイ化したり、多層構造化することによって、機能性を高めることができる。本発明においては、例えば、ポリエチレン／エチレン－ビニルアルコール共重合体のケン化物／ポリスチレン、ポリプロピレン／エチレン－ビニルアルコール共重合体のケン化物／ポリプロピレン、ポリエチレン／エチレン－ビニルアルコール共重合体のケン化物／ポリエチレンのように、３層構造とし、中間層に、例えばエチレン－ビニルアルコール共重合体のケン化物のようなバリヤー性樹脂を用いることで、飲料抽出容器の保管時に、抽出用の粉末が酸化劣化したり、香り成分が揮散してしまうことを防止し、抽出時の抽出液の品質を損なうことなく、商品としての品質を高めることができる。

【００１３】

本発明の飲料フィルターカートリッジの製造方法は、特に制限はないが、例えば、側壁および底壁を射出成形法にて成形して得た後、真空成形、圧空成形により所定の形状に賦形したフィルター部を、前記側壁と接するように一体化することにより得られる。一体化する方法は特に制限はないが、例えば、第一の方法として、前記フィルター部上辺縁を、熱プレス等の手段により枠状とし、前記フィルター枠状部が側壁と脱着可能な構造とすることで、フィルター部と側壁を嵌合し一体構造とすることができる。なお、この場合嵌合部が抽出時に外れて、抽出用の粉末、お湯が漏れ出ることが無きよう前記枠状部は強固な構造とする。側壁下部に必要に応じて凹み状の段を設け、前記凹み状の段にフィルター枠状部が嵌め込み、容易に外れない構造とすることが肝要である。第二の方法として、予め賦形したフィルター部を金型内に挿入し、溶融した熱可塑性樹脂を流入させ、側壁および底壁の成形を行うとともにフィルター部との接着も同時に行うことが挙げられる。第三の方法としては、予め賦形したフィルター部、成形した側壁および底壁のそれぞれを金型内に挿入し、溶融した他の樹脂を流入させ、フィルター部、側壁の接合部に鉢巻状に前記他の樹脂を巻き付け、接合することが挙げられる。

【００１４】

本発明で得られた飲料フィルターカートリッジは、飲料抽出用の粉末を封入した後、側壁上方開口部が蓋材を用いてシールされ密閉構造とした飲料抽出容器とすることで、長期保管が可能なものとすることができる。

【００１５】

本発明の飲料抽出容器は、蓋材および底壁に対し孔を開けた後、熱湯を注ぐことによって、飲料抽出を行うことができる。そのような飲料抽出装置は、例えば、コーヒー、紅茶、緑茶等各種嗜好性飲料において、利用が可能である。

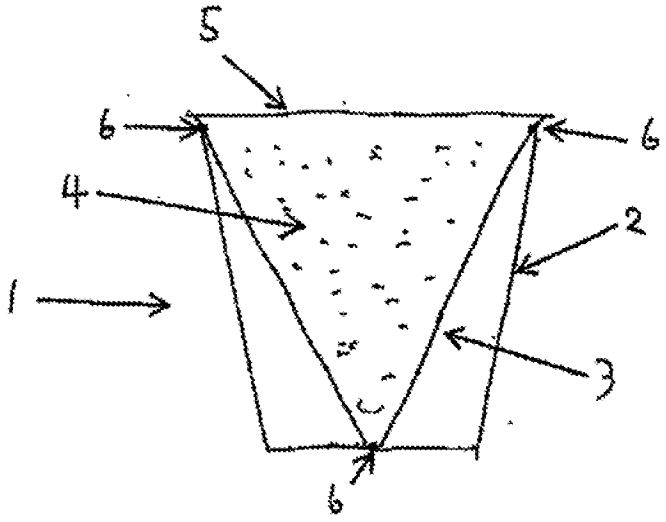
【符号の説明】

【００１６】

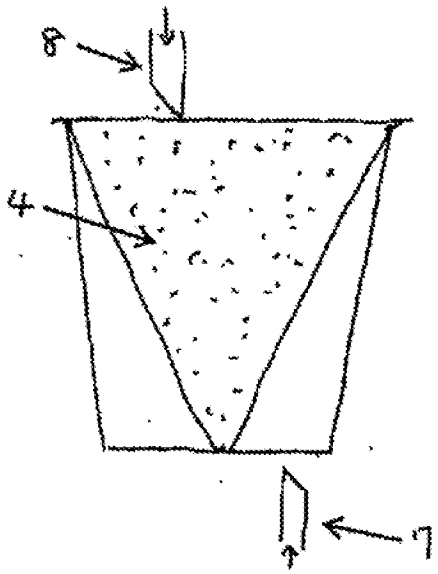
1　従来のフィルターカートリッジ
2　枠
3　フィルター部
4　挽いたコーヒー

5 フタ
6 溶着部
7 出口用針
8 入口用針
9 本発明のフィルター部材
10 本発明のフィルターカートリッジ
11 本発明のフィルターカートリッジ
12 フィルター要素
13 フィルター用枠
14 フィルター要素
15 固定用凸

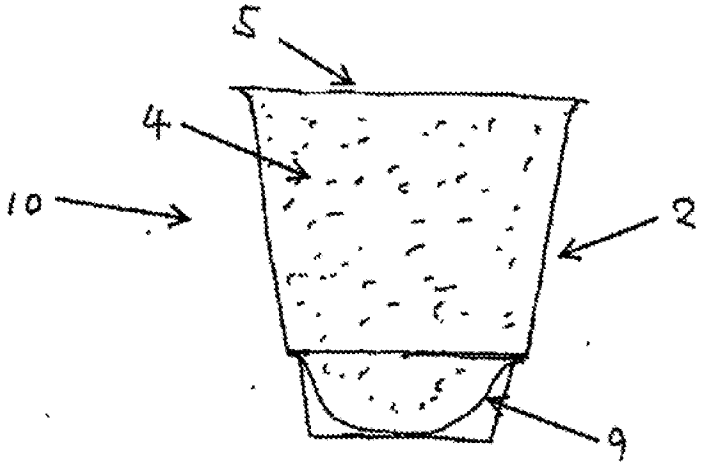
【図１】



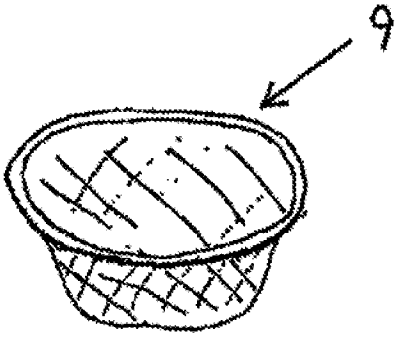
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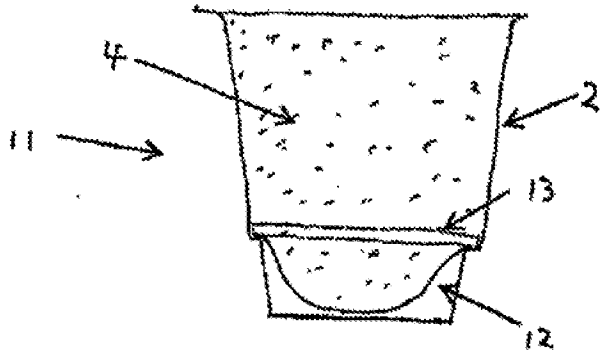
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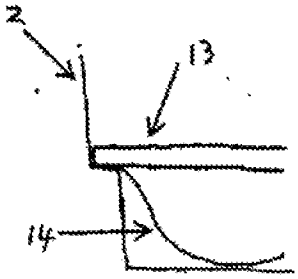
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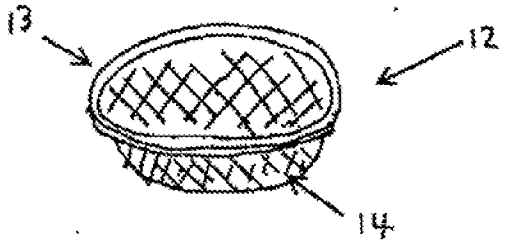
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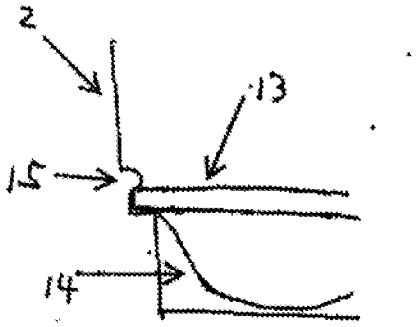
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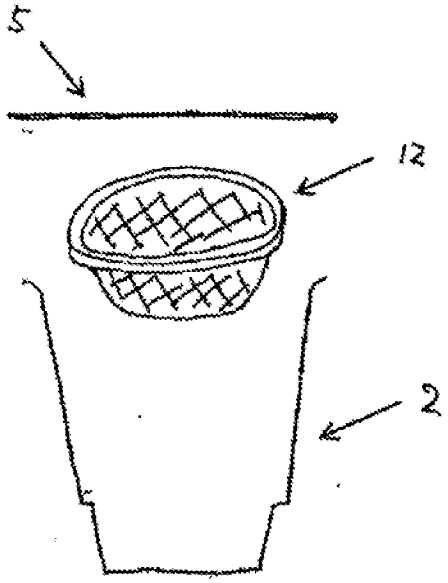
【図７】



【図８】



【図９】



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BEVERAGE FILTER CARTRIDGE AND BEVERAGE EXTRACTION CONTAINER USING THE SAME

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Abstract of JP2015085086 (A)

PROBLEM TO BE SOLVED: To provide a beverage filter cartridge which is used in a beverage extraction container for extracting a cup of a beverage, can enclose a sufficient amount of beverage extracting powder for extraction, suppresses the clogging in the extraction, and can perform the necessary and sufficient extraction.SOLUTION: A beverage filter cartridge 10 includes: a cup type container having a bottom wall and a side wall extending from the bottom wall to a circular edge surrounding an upper opening part; and a filter part 3 which is shaped into a semi-circle and has water permeability. The filter part 3 is inserted in the inside so as to make contact with an inner wall of the cup type container and so as to make a semicircular protruding part protrude downward. Further, powder 4 for extracting a beverage is enclosed inside the cup type container, and a lid material 5 is bonded to the upper opening part of the cup type container to achieve a sealed structure.

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DESCRIPTION JP2015085086

PROBLEM TO BE SOLVED: To provide a beverage filter cartridge for use in a beverage extraction container for full extraction, wherein a sufficient amount of powder for beverage extraction for extraction can be enclosed, clogging at the time of extraction is suppressed, and necessary and sufficient extraction is performed To provide a beverage filter cartridge that can A beverage filter cartridge (10) is semi-circularly shaped and has water permeability, and a cup-shaped container having a bottom wall and a side wall extending from the bottom wall to a circular edge surrounding the upper opening. The filter portion 3 is inserted so that the filter portion 3 is in contact with the inner wall of the cup-shaped container and the semicircular convex portion protrudes downward, and the cup-shaped container is further inside. The powder 4 was sealed, and the lid 5 was adhered to the upper opening of the cup-shaped container to form a sealed structure. [Selected figure] Figure 3

Beverage filter cartridge and beverage extraction container using the same

[0001]

The present invention relates to a beverage filter cartridge for use in a beverage brewing container for full brewing.

[0002]

Coffee, black tea, green tea, etc. are put in powder form and put into powder extraction filter, and set in a predetermined position of the extraction device for beverage, hot water is poured by pouring water from above, You can make hot tea and so on.

Although the beverage extraction device in which the beverage extraction filter is set is mainly used for business use, miniaturized ones usable for household use are also in widespread use.

[0003]

For example, Patent Document 1 discloses a beverage filter cartridge used in the above-described beverage brewing device. Such a beverage filter cartridge is formed of a resin-made container, and the filter portion is housed inside the container. The top of the container is sealed by a lid. The lid is formed of a film sheet.

[0004]

When coffee etc. is extracted, hot water is poured from the lid at the top of the cartridge by penetrating the pouring needle or directly from the lid at the top. In addition, the extraction needle is penetrated from the bottom of the cartridge. Thus, the favorite product can be extracted from the cartridge and poured into a coffee cup or the like placed at the lower part of the cartridge.

[0005]

Patent No. 3742344

[0006]

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The present inventors have found the following.

When a beverage filter cartridge having the above-described structure is used, first, the internal volume of the filter portion to be accommodated becomes relatively small relative to the internal volume of the resin container. There is a restriction that the powder can not be enclosed in a sufficient amount. Also, since the resin container and the filter unit are not completely integrated, the filter effect is sufficient in the early stage of extraction in the beverage extraction process, but as the extraction progresses, the powder for beverage extraction becomes in addition to the filter clogging, the filter effect may be reduced and the necessary and sufficient extraction may not be performed. The present invention is a beverage filter cartridge for use in a beverage extraction container for full-browsing, wherein a sufficient amount of powder for beverage extraction for extraction can be enclosed, clogging at the time of extraction can be suppressed, and necessary and sufficient extraction The purpose is to provide a beverage filter cartridge that can be performed.

[0007]

The present inventors arrived at the present invention as a result of intensive studies to solve the above-mentioned problems. That is, the gist of the present invention is as follows. (1) A beverage filter cartridge, comprising: a cup-shaped container having a bottom wall and a side wall extending from the bottom wall to a circular edge surrounding the upper opening; and a semicircular shaped filter having water permeability And the filter portion is inserted so that the semicircular convex portion protrudes downward, and the cup portion is further provided with a portion for extracting a beverage. A powder is enclosed and a lid material is adhered to the upper opening of the cup-shaped container to form a sealed structure. (2) The beverage filter cartridge according to (1), wherein the filter portion is a non-woven fabric made of a thermoplastic resin. (3) The beverage filter cartridge according to (1) or (2), wherein the side wall and the bottom wall are a multilayer structure made of a thermoplastic resin. (4) The beverage filter cartridge according to (1) to (3), wherein the upper edge of the filter portion is heat-pressed into a frame shape, and the frame shape of the filter portion is detachable from the cup side wall. (5) The beverage filter cartridge of (1) to (3), wherein the upper edge of the filter part is integrally formed with the cup-shaped container. (6) The beverage filter cartridge of (1) to (3), wherein the upper edge of the filter portion is joined to the cup-shaped container using another resin. (7) A beverage extraction device to be used by mounting the beverage filter cartridge of (1) to (6).

[0008]

According to the present invention, it is a beverage filter cartridge for use in a beverage extraction container for full-browsing, wherein a sufficient amount of powder for beverage extraction for extraction can be enclosed, clogging at the time of extraction can be suppressed, and necessary and sufficient A beverage filter cartridge is obtained which can be extracted. A beverage extraction container using such a beverage filter cartridge can be used while suppressing the decrease in extraction capacity while increasing the extraction amount.

[0009]

FIG. 1 is a cross-sectional view of a beverage filter cartridge illustrating an embodiment of the prior art. FIG. 5 is a cross-sectional view showing a form of beverage extraction in a prior art beverage filter cartridge. FIG. 1 is a cross-sectional view of a beverage filter cartridge showing an embodiment of the present invention. FIG. 5 is a perspective view of the bottom wall of the beverage filter cartridge of the present invention. FIG. 1 is a cross-sectional view of a beverage filter cartridge showing an embodiment of the present invention. It is sectional drawing which shows the aspect of the bottom wall (with frame) and side wall in the drink filter cartridge of this invention. It is a perspective view of the bottom wall (with a frame) in the drink filter cartridge of the present invention. It is sectional drawing which shows the aspect of the bottom wall (with frame) and side wall (there is a convex for fixation) in the drink filter cartridge of this invention. It is sectional drawing which shows the structure of the drink filter cartridge which shows embodiment in this invention.

[0010]

Hereinafter, the present invention will be described in detail. The beverage filter cartridge of the present invention comprises a cup-shaped container having a bottom wall and a side wall extending from the bottom wall to a circular edge surrounding the upper opening, a semicircular shaped filter portion having water permeability And the filter portion is inserted so that the semicircular convex portion is in contact with the inner wall of the cup-shaped container and the semicircular convex portion protrudes downward, and further, powder for beverage extraction is contained in the cup-shaped container, and it is sealed so that it is enclosed and has a sealed structure in which a lid is adhered to the upper opening of the cup-shaped container.

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[0011]

The material constituting the filter part is not particularly limited as long as it has water permeability. Examples of the material having water permeability include paper, woven fabric, non-woven fabric and the like, and when woven fabric and non-woven fabric are used, they are selected from natural fibers and synthetic fibers. Examples of natural fibers include cotton, wool and various vegetable fibers, and examples of synthetic fibers include homopolymers, copolymers or mixtures of thermoplastic resins such as nylon, polyester, polypropylene and polyethylene. In addition, different types of woven fabric and non-woven fabric obtained and fabric weight can be used in combination according to the application. In the present invention, nonwoven fabrics made of various thermoplastic resins can be suitably used. In particular, in food applications, polyester and polypropylene are preferable because they are excellent in the balance of heat resistance and mechanical strength at the time of extraction. In order to enable shaping, it is preferable that the weight per unit area be small, and in order to enhance the filter effect, it is particularly preferable to use a non-woven fabric obtained by the melt-blowing method.

[0012]

The material constituting the side wall and the bottom wall is not particularly limited, but various thermoplastic resins can be used in order to make it excellent in moldability as a cup container, adhesion to the bottom wall, or welding aptitude. . The thermoplastic resin may, for example, be nylon, polyester, polypropylene, polyethylene, polystyrene, or a saponified ethylene-vinyl alcohol copolymer, and in view of formability, polyester, polypropylene, polyethylene, polystyrene, ethylene-vinyl alcohol copolyester. Preferred are saponified polymers and the like. Moreover, functionality can be improved by combining and 2 or more types, and alloying or multilayered structure. In the present invention, for example, saponified polyethylene / ethylene-vinyl alcohol copolymer / polystyrene, polypropylene / ethylene-vinyl alcohol copolymer saponified / polypropylene, polyethylene / ethylene-vinyl alcohol copolymer saponified / By using a barrier resin such as a saponified ethylene-vinyl alcohol copolymer as a three-layer structure and polyethylene as in the intermediate layer, the powder for extraction is oxidatively deteriorated during storage of the beverage extraction container. As a result, it is possible to prevent the aroma components from volatilizing and to improve the quality of the product without impairing the quality of the extract at the time of extraction.

[0013]

The method for producing the beverage filter cartridge of the present invention is not particularly limited. For example, a filter obtained by forming the side wall and the bottom wall by injection molding, and then forming into a predetermined shape by vacuum forming or pressure forming. It is obtained by integrating a portion into contact with the side wall. There is no particular limitation on the method of integration, but for example, as the first method, the upper edge of the filter portion is framed by means such as a heat press, and the filter frame portion is structured to be removable from the side wall. Thus, the filter portion and the side wall can be fitted to form an integral structure. In this case, the frame-like part has a strong structure so that the fitting part is detached at the time of extraction and the powder for extraction and hot water do not leak out. It is important that the filter frame-like portion be fitted in the recess-like step so as to be structured so as not to be easily removed. The second method is to insert a pre-shaped filter part into a mold, allow molten thermoplastic resin to flow, and form the side wall and the bottom wall simultaneously with bonding with the filter part. . The third method is to insert each of the pre-shaped filter part, the molded side wall and the bottom wall into the mold, and let the molten other resin flow to make the filter part and the joint part of the side wall in a head-clad manner It may be mentioned that the other resin is wound and joined.

[0014]

The beverage filter cartridge obtained in the present invention can be stored for a long period of time by sealing the powder for beverage extraction and then sealing the upper opening of the side wall with a lid material to form a sealed beverage extraction container. It can be

[0015]

The beverage extraction container of the present invention can perform beverage extraction by pouring hot water after drilling holes in the lid and the bottom wall.

Such a beverage extraction device can be used, for example, in various palatable beverages such as coffee, black tea, green tea and the like.

[0016]

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DESCRIPTION OF REFERENCE NUMERALS 1 conventional filter cartridge 2 frame 3 filter portion 4 ground coffee 5 lid 6 welding portion 7 outlet needle 8 inlet needle 9 filter member 10 of the present invention filter cartridge 10 of the present invention filter cartridge 11 of the present invention filter element 12 filter element 13 filter Frame 14 Filter element 15 Convex for fixing

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CLAIMS JP2015085086

1.

A beverage filter cartridge comprising: a cup-shaped container having a bottom wall and a side wall extending from the bottom wall to a circular edge surrounding the upper opening; and a semi-circular shaped water-permeable filter portion The filter portion is inserted in such a manner that the semicircular convex portion is in contact with the inner wall of the cup-shaped container, and the powder for beverage extraction is enclosed in the cup-shaped container. And a lid material is adhered to the upper opening of the cup-shaped container to form a sealed structure.

2.

The beverage filter cartridge according to claim 1, wherein the filter portion is a non-woven fabric made of a thermoplastic resin.

3.

The beverage filter cartridge according to claim 1, wherein the side wall and the bottom wall are a multilayer structure made of a thermoplastic resin.

4.

The beverage filter cartridge according to any one of claims 1 to 3, wherein the upper edge of the filter portion is heat-pressed into a frame shape, and the frame shape of the filter portion is detachable from the side wall of the cup-shaped container.

5.

The beverage filter cartridge according to any one of claims 1 to 3, wherein the upper edge of the filter portion is integrally formed with the cup-shaped container.

6.

The beverage filter cartridge according to any one of claims 1 to 3, wherein the upper edge of the filter portion is joined to the cup-shaped container using another resin.

7.

A beverage extraction apparatus using the beverage filter cartridge according to claim 1.

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심사청구 : 없음

발열식 영양음료의 조제를 위한 카트리지

요약

일 이상의 음료 성분(308)을 포함하고 사실상 공기 및 물이 침투할 수 없는 재료로 형성되는 카트리지(1)에며, 상기 카트리지는 일 이상의 음료 성분을 포함하는 저장 챔버(130; 134)와 애니콜드 챔버(16)를 한정하고, 애니콜드 챔버를 닫는 제1 부분과 저장 챔버를 닫는 제2 부분을 가지는 두정(5)에 의해 폐쇄될 수 있는 개구(12)를 포함하며, 상기 개구를 통해 일 이상의 음료 성분이 저장 챔버로 충전될 수 있고, 상기 두정의 제1 부분은 사용시에 수성 매체의 애니콜드 챔버로의 유입을 수용하도록 천공 가능하고, 두정은 사용시에 저장 챔버 내의 일 이상의 음료 성분과 수성 매체의 상호 작용으로부터 형성된 음료의 유출을 수용하도록 천공 가능한 카트리지.

대표도
도11

색인어
음료 조제 기계, 음료 카트리지, 카트리지 홀더, 폐쇄 기구, 폐합형 레버, 호크 부재

명세서

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기술분야

[0001] 본 발명은 음료의 조제(preparation)를 위한 카트리지, 특히 사실상 공기와 물에 대해 불투과성인 재료로부터 형성되고 음료의 조제를 위한 하나 이상의 성분을 함유하는 일회용 카트리지에 관한 것이다.

종래기술

[0002] 개별 공기 불투과성 패키지에서 음료 조제 성분을 일회용하는 것은 종래에 제안되었다. 예를 들면, 일반적으로 "에스프레소" 기계로 불리는 소형의 커피 조제 기계에 사용하기 위한 치밀하게 분쇄된 커피(compacted ground coffee)를 함유하는 카트리지 또는 캡슐이 공지되어 있다. 이러한 조제 기계를 사용하는 커피의 제조에서, 커피 카트리지는 추출 챔버(brewing chamber) 내에 배치되고, 온수는 비교적 높은 압력에서 카트리지를 통과함으로써, 커피 음료를 제조하도록 분쇄된 커피로부터 커피향 성분을 추출한다.

전형적으로, 이러한 기계는 6×10^5 Pa을 초과하는 압력에서 작동한다. 설명한 유형의 조제 기계는 현재, 물 펌프와 서멀(seal)과 같은 기계의 부품이 고압을 견딜 수 있어야 하기 때문에, 비교적 고가의 기계이다.

[0003] 국제 특허 공보 제 01/58782호에는, 대체로 0.7 내지 2.0×10^5 Pa 범위의 압력에서 작동하는 음료의 조제를 위한 카트리지가 설명되어 있다. 그러나, 카트리지는 산업용 또는 산업용 시장을 위한 음료 조제 기계에서 사용되도록 설계되어 있어, 비교적 고가이다. 따라서, 카트리지와 음료 조제 기계가 특히 비용, 중량 및 신뢰성의 관점에서 가정용 시장에 적합한, 음료의 조제를 위한 카트리지에 대한 요구가 남아 있다.

[0004] 통상적으로 공지된 음료 카트리지에서, 음료 카트리지의 입구와 출구는 카트리지의 대향 측부에 형성된다. 카트리지를 분배하기 위해 사용되는 음료 제조 기계는 입구 및 출구 전공부가 반대 방향으로부터 카트리지와 결합하게 이동하도록 복잡한 기계적 장치를 요하는 단점이 있다. 또한, 입구 및 출구 전공부는 음료 카트리지가 음료 조제 기계에 삽입 및 제거를 위한 접근하는 것을 방해할 수 있다. 국제공개공보 제 01/60020호에는, 입구 및 출구가 카트리지의 동일한 측부에 형성된 음료 카트리지가 개시되어 있다. 그러나, 이러한 카트리지는 입구 전공부가 음료 생성과 직접 접촉할 수 있으므로 상기 입구 전공부를 막기 쉽다.

발명의 상세한 설명

[0005] 따라서, 본 발명은 일 이상의 음료 성분을 포함하고 사실상 공기 및 물에 불투과할 수 있는 재료로 형성된 카트리지를 제공하는데, 상기 카트리지는 일 이상의 음료 성분을 포함하는 저장 챔버와 메니홀드 챔버를 형성하고, 메니홀드 챔버를 닫는 제1 부분과 저장 챔버를 닫는 제2 부분을 가지는 부재에 의해 형성될 수 있는 개구를 포함하며, 상기 개구를 통해 일 이상의 음료 성분이 저장 챔버로 충전될 수 있고, 상기 부재의 제1 부분은 추출 동안에 메니홀드 챔버로의 유입을 수용하도록 사용시에 천공 가능하고, 부재는 저장 챔버 내의 일 이상의 음료 성분과 추출 동안의 상호 작용으로부터 형성된 음료의 유출을 수용하도록 사용시에 천공 가능하다.

[0006] 본 명세서에 사용된 용어 "카트리지"는 건조된 방식으로 하나 이상의 음료 성분을 함유하는 임의의 패키지, 용기, 작은 봉지(sachet) 또는 리셉터클을 의미한다.

[0007] 본 발명과 함께 사용하기 위한 카트리지는 음료 제품의 조제에 적합한 하나 이상의 음료 성분을 함유할 수 있다. 음료 제품은, 예컨대 커피, 차, 코코아, 또는 이것을 포함하는 혼재물과 음료 중 하나일 수 있다. 음료 성분은 분말형, 분쇄형, 입형, 또는 액상일 수 있다. 음료 성분은 볶음일 또는 가볍볶일 수 있다. 가볍볶은 볶은 분쇄된 커피, 잎차, 분말 초콜릿과 수프, 액상 우유계 음료 및 동결 건조 주스를 포함한다.

[0008] 본 발명의 카트리지는 카트리지로부터의 음료 유입 및 유출을 통합한 측부 쪽, 또한으로부터 이루진다는 점에서 유리하다. 이것은 카트리지와 함께 사용되는 음료 조제 기계의 유입 및 유출 천공부가 용이하게 제공되므로 보다 안심하게 할 수 있다. 또한, 음료 조제 기계의 단체 설계는 전술 수단 및 그와 관련한 유동 파이프를 카트리지의 상부 또는 하부에 제공할 필요가 없으므로 간소할 수 있다. 또한, 보다 적절한 개수의 부품의 카트리지 쉬운 위치할 수 있으므로, 음료 조제 기계로 카트리지를 삽입 및 제거하기 위한 접근로 개선된다. 또한, 본 발명의 카트리지는 사용시에 물과 같은 수성 매체가 도입되는 메니홀드 챔버를 제공한다. 상기 메니홀드 챔버는 음료 성분을 포함하는 저장 챔버로부터 분리된다. 음료 조제 기계의 유입 천공부의 왜곡은 상기 유입 천공부가 음료 성분과 직접 접촉하지 않으므로 방지된다. 또한, 메니홀드 챔버는 카트리지 내의 통과량을 개선하고 저장 챔버로의 물 유동 및 저장 챔버를 통한 물 유동의 균일성을 개선한다. 이것은 음료 카트리지로부터 향미의 지속성을 향상시킨다.

[0009] 양호하게는, 상기 카트리지는 사용시에 수성 매체와 저장 챔버 내의 일 이상의 음료 성분 간의 상호 작용으로부터 형성된 음료 유출을 수용하기 위해 천공될 수 있는 부재의 제3 부분 이외에 있는 배출 챔버를 더 포함한다.

[0010] 양호하게는, 배출 챔버는 배출구를 포함한다.

[0011] 양호하게는, 메니홀드 챔버와 저장 챔버는 일 이상의 개구를 포함하는 구획부에 의해 나뉘진다. 상기 개구는 일 이상의 음료 성분이 저장 챔버로부터 메니홀드 챔버로 들어가는 것을 방지하는 크기이다. 음료 성분이 상기 개구를 통과할 수 있으므로, 메니홀드 챔버는 음료 성분이 없게 유지된다.

[0012] 양호하게는, 메니홀드 챔버는 적어도 부분적으로 저장 챔버를 둘러싼다. 일 실시예에서, 메니홀드 챔버는 저장 챔버를 사실상 완전히 둘러싼다. 통상적으로, 메니홀드 챔버는 사실상 저장 챔버를 둘러싸고 개구는 상기 메니홀드 챔버와 저장 챔버 사이의 사실상 모든 계면을 따라 제공된다.

[0013] 양호하게는, 개구는 0.25 내지 0.35 ㎜의 폭과 1.4 내지 1.8 ㎜의 길이를 가진다. 통상적으로 20 내지 40

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개의 개구가 제공된다.

[0014] 양호하게는, 매니폴드 챔버는 수성 매체가 도입되는 입구부를 포함하는데, 상기 입구부는 둘 이상의 개구를 통해 매니폴드 챔버의 간극들과 연통한다. 양호하게는, 입구부는 원형이다.

[0015] 양호하게는, 저장 챔버 및 배출 챔버는 내부 부재에 의해 분할된다. 상기 내부 부재는 둘 이상의 개구를 포함한다. 일 실시예에서, 내부 부재는 용융의 통과를 수용하는 동안 둘 이상의 용융 성분이 저장 챔버로부터 배출 챔버로 들어가는 것을 방지하는 필터를 포함한다.

[0016] 양호하게는, 투과는 외부 부재 및 내부 부재와 결합된다. 통상적으로, 상기 투과는 카트리지의 주연부 주위에서 외부 부재와 결합하고 카트리지의 중심 근처에서 내부 부재와 결합한다. 투과는 내부 부재의 배출 챔버에 결합될 수도 있다.

[0017] 양호하게는, 외부 부재는 투과보다 큰 곤고성을 가진다.

[0018] 양호하게는, 유입 및 유출을 수용하기 위한 투과의 연통부는 카트리지를 통과하는 수성 매체가 입구로부터 출구로 내향 이동하도록 위치된다.

[0019] 또한 양호하게는, 카트리지는 수성 매체가 저장 챔버를 통상적으로 상향 완통하도록 형성된다.

[0020] 본 발명은 또한 상기한 바와 같은 카트리지를 복수개 제공할 수 있는데, 카트리지에 포함된 둘 이상의 용융 성분으로부터 생산된 용융의 산출률은 1.0 표준 편차 내에서 유지된다.

[0021] 본 발명은 또한 상기한 바와 같은 카트리지의 사용 방법을 제공하는데, 카트리지로의 입구 또는 카트리지로부터의 출구를 형성하기 위해, 카트리지가 둘 이상의 절적 접촉 요소에 상대적으로 변위된다. 이것은 환경적 부분 일련 이동할 것을 요하지 않는 단순화된 연통 기구가 사용될 수 있다는 점에서 유리하다. 또한, 연통 요소가 정적이므로 카트리지와 연통 요소의 보다 정밀한 정렬이 성취되며서, 특히 유출에서 수성 매체의 튀김이 감소되고 성능이 개선된다.

[0022] 또한, 본 발명은 둘 이상의 용융 성분을 포함하고 사실상 공기 및 물에 침투할 수 없는 재료로 형성된 카트리지를 제공하는데, 상기 카트리지는 둘 이상의 용융 성분을 포함하는 챔버를 형성하고 투과를 더 포함하며, 사용시 수성 매체의 유입과 유출 모두를 수용하도록 카트리지가 수평 방향으로 있을 때 투과이 전부 가능하도록 카트리지가 형성되며서, 챔버 내의 둘 이상의 용융 성분과 수성 매체의 상호 작용으로부터 용융물을 형성한다. 유리하게는, 사용중에 카트리지의 수평 위치 선정은 카트리지를 통과 수성 매체의 유동이 최적화되도록 한다. 카트리지가 수직으로 배향된다면, 물 또는 다른 수성 매체는 중력의 영향으로 빨르게 유동하고 용융 성분이 있는 부분을 우회할 것이다. 카트리지가 수평으로 배향된다면, 이러한 문제점은 물의 입구 및 출구 위치 사이의 상향 유동 요소를 배치하여 회피될 수 있다.

[0023] 양호하게는, 수성 매체의 유입은 제1 챔버로 향하고 용융의 유출은 제2 챔버로부터 이루어진다. 제1 챔버는 매니폴드 챔버일 수 있다. 제2 챔버는 배출 챔버일 수 있다. 양호하게는, 상기 매니폴드 챔버 및 배출 챔버와 통과되어 있는, 둘 이상의 용융 성분을 포함하는 저장 챔버가 제공된다.

[0024] 하기의 설명에서, 용어 "상부"와 "하부" 및 이의 동가의 용어는 본 발명의 특정부의 절적 위치 관계를 설명하기 위해에 사용될 것이다. 용어 "상부"와 "하부" 및 이의 동가의 용어는 중력 조제 기계 내부로의 지향 및 후속하는, 예컨대 도해에 도시된 바와 같은 배출을 위한 그의 정상 배향 상태에 있는 카트리지(또는 다른 구성 요소)를 지칭하는 것으로 이해되어야 한다. 통히, "상부"와 "하부"는 각각 카트리지의 상단부분(1)과 가깝거나 멀리 있는 상대 위치를 지칭한다. 또한, 용어 "내부"와 "외부" 및 이의 동가의 용어는 본 발명의 특정부의 절적 위치 관계를 설명하기 위하여 사용될 것이다. 용어 "내부"와 "외부" 및 이의 동가의 용어는 각각 카트리지(1)(또는 다른 구성 요소)의 중심 또는 주축(X)과 가깝거나 멀리 있는 상대의 카트리지(또는 다른 구성 요소)의 상대 위치를 지칭하는 것으로 이해되어야 한다.

[0025] 이제, 본 발명의 실시예가 첨부 도면을 참조하여 단지 예시의 목적으로 설명될 것이다.

도면의 간략한 설명

[0026] 도1은 본 발명과 함께 사용하기 위한 카트리지의 제1 및 제2 실시예의 외부 부재의 단면도이다.

[0027] 도2는 내향 원통형 연결부를 도시하는, 도1의 외부 부재의 상세의 단면도이다.

[0028] 도3은 슬롯을 도시하는, 도1의 외부 부재의 상세의 단면도이다.

[0029] 도4는 도1의 외부 부재의 위에서 본 사시도이다.

[0030] 도5는 간도되어 배향된 도1의 외부 부재의 위에서 본 사시도이다.

[0031] 도6은 도1의 외부 부재의 위에서 본 평면도이다.

[0032] 도7은 카트리지의 제1 실시예의 내부 부재의 단면도이다.

[0033] 도8은 도7의 내부 부재의 위에서 본 사시도이다.

[0034] 도9는 간도되어 배향된 도7의 내부 부재의 위에서 본 사시도이다.

[0035] 도10은 도7의 내부 부재의 위에서 본 평면도이다.

[0036] 도11은 조립된 상태의 카트리지의 제1 실시예의 단면도이다.

[0037] 도12는 카트리지의 제2 실시예의 내부 부재의 단면도이다.

[0038] 도13은 개구를 도시하는, 도12의 내부 부재의 상세의 단면도이다.

[0039] 도14는 도12의 내부 부재의 위에서 본 사시도이다.

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[0040] 도15는 관도되어 해당된 도12의 내부 부재의 위에서 본 사시도이다.

[0041] 도16은 도12의 내부 부재의 다른 단면도이다.

[0042] 도17은 공기 입구를 도시하는, 도12의 내부 부재의 다른 상세의 단면도이다.

[0043] 도18은 조립된 상태의 카트리지의 제2 실시예의 단면도이다.

[0044] 도19는 본 발명과 함께 사용되기 위한 카트리지의 제3 및 제4 실시예의 외부 부재의 단면도이다.

[0045] 도20은 내장 입통형 연장부를 도시하는, 도19의 외부 부재의 상세의 단면도이다.

[0046] 도21은 도19의 외부 부재의 위에서 본 평면도이다.

[0047] 도22는 도19의 외부 부재의 위에서 본 사시도이다.

[0048] 도23은 관도되어 해당된 도19의 외부 부재의 위에서 본 사시도이다.

[0049] 도24는 카트리지의 제3 실시예의 내부 부재의 단면도이다.

[0050] 도25는 도24의 내부 부재의 위에서 본 평면도이다.

[0051] 도26은 내장 상부 힘을 도시하는, 도24의 내부 부재의 상세의 단면도이다.

[0052] 도27은 도24의 내부 부재의 위에서 본 사시도이다.

[0053] 도28은 관도되어 해당된 도24의 내부 부재의 위에서 본 사시도이다.

[0054] 도29는 조립된 상태의 카트리지의 제3 실시예의 단면도이다.

[0055] 도30은 카트리지의 제4 실시예의 내부 부재의 단면도이다.

[0056] 도31은 도30의 내부 부재의 위에서 본 평면도이다.

[0057] 도32는 도30의 내부 부재의 위에서 본 사시도이다.

[0058] 도33은 관도되어 해당된 도30의 내부 부재의 위에서 본 사시도이다.

[0059] 도34는 조립된 상태의 카트리지의 제4 실시예의 단면도이다.

[0060] 도35는 본 발명에 따른 음료 조제 기계의 전방 사시도이다.

[0061] 도36은 카트리지 헤드가 개방 위치에 있는, 도35의 기계의 전방 사시도이다.

[0062] 도37은 명확함을 위하여 일부 부분이 생략된, 도35의 기계의 후방 사시도이다.

[0063] 도38은 명확함을 위하여 일부 부분이 생략된, 도35의 기계의 다른 후방 사시도이다.

[0064] 도39는 명확함을 위하여 일부 부분이 생략된, 도35의 기계의 카트리지 헤드의 사시도이다.

[0065] 도40은 명확함을 위하여 일부 부분이 생략된, 도35의 기계의 카트리지 헤드의 다른 사시도이다.

[0066] 도41은 폐쇄 위치의 카트리지 헤드의 단면도이다.

[0067] 도42는 개방 위치의 카트리지 헤드의 단면도이다.

[0068] 도43은 도35의 기계의 개략적인 레이아웃을 도시한다.

[0069] 도44a 및 도44b는 도35의 기계를 위한 제1 및 제2 코드 인식 수단의 개략적인 레이아웃을 도시한다.

[0070] 도45는 바코드를 포함하는 본 발명의 음료의 평면도이다.

실시예

[0071] 도1에 도시된 바와 같이, 본 발명의 카트리지(1)는 일반적으로 외부 부재(2), 내부 부재(3) 및 라미네이트(5)를 포함한다. 외부 부재(2), 내부 부재(3) 및 라미네이트(5)는 하나 이상의 음료 성분을 함유하는 내부(120), 입구(121), 출구(122), 및 입구(121)를 출구(122)에 연결하고 내부(120)를 통과하는 음료 유동 경로를 갖는 카트리지(1)를 형성하도록 조립된다. 입구(121)와 출구(122)는 조기에는 라미네이트(5)에 의해 밀봉되어 있으며, 사용시 라미네이트(6)의 천공 또는 절단에 의해 개방된다. 음료 유동 경로는 혼합되는 바와 같이 외부 부재(2), 내부 부재(3) 및 라미네이트(5) 사이의 공간적인 내부 관계에 의해 형성된다. 이러한 추가로 설명될 필터(4)와 같은 다른 구성 요소가 카트리지(1) 내에 임의로 포함될 수 있다.

[0072] 최상 지식을 제공할 목적으로 설명될 카트리지(1)의 제1 형태가 도1 내지 도11에 도시되어 있다. 카트리지(1)의 제1 형태는 특히 볶고 분쇄된(roast and ground) 커피 또는 잎차(leaf tea)와 같은 여과되는 제품의 분배에 사용되도록 설계된다. 그러나, 여러한 형태의 카트리지(1)와 혼합되는 다른 형태는 초콜릿, 커피, 차, 감미료(sweeteners), 코디얼스(cordials), 향미제(flavourings), 주류(alcoholic beverage), 향취 우유(flavoured milk), 과일 주스, 스쿼시, 소스 및 디저트와 같은 다른 제품과 함께 사용될 수도 있다.

[0073] 도1로부터 알 수 있는 바와 같이, 카트리지(1)의 전체적인 형상은 대체로, 카트리지(1)의 직경이 그의 높이보다 상당히 큰 원형 또는 디스크 형상이다. 주축(X)은 도1에 도시된 바와 같이 외부 부재의 중심을 통과한다. 전형적으로, 외부 부재(2)의 총 직경은 74.5 ㎜ ±6 ㎜이고, 총 높이는 16 ㎜ ±3 ㎜이다. 전형적으로, 조립될 때의 카트리지(1)의 부피는 30.2 ㎖ ±20㎖이다.

[0074] 외부 부재(2)는 일반적으로 폭산형 환형 벽(13), 폭쇄 상단부(11) 및 개방 하단부(12)를 갖는 보울(bowl)

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형상의 홈(10)을 포함한다. 외부 부재(2)의 직경은 하단부(12)에서의 직경과 비교하면 상단부(11)에서 보다 작으며, 이는 환형 벽(13)이 몸체 상단부(11)로부터 개방 하단부(12)까지 벌어진 결과이다. 환형 벽(13)과 몸체 상단부(11)는 함께 내부(34)를 갖는 리셉터클을 형성한다.

[0075] 몸체형의 내장 원통형 연장부(18)가 주축(X) 상에 중심을 두고 몸체 상단부(11) 내에 제공된다. 도면에 더욱 명확하게 도시된 바와 같이, 원통형 연장부(18)는 제1, 제2 및 제3 부분(19, 20, 21)을 갖는 단계형 프로파일을 포함한다. 제1 부분(19)은 직각인 원형 원통이다. 제2 부분(20)은 원추형 형상을 갖고 내측으로 테이퍼져 있다. 제3 부분은 다른 형태의 원통인 원통이며, 하부단(31)에 의해 폐쇄되어 있다. 제1, 제2 및 제3 부분(19, 20, 21)의 직경은 원통형 연장부(18)의 직경이 원통형 연장부(18)의 상단부(11)로부터 폐쇄된 하부단(31)까지 가로질러 감소하도록 종료적으로 감소한다. 대체물 수형의 리부(32)가 제2 및 제3 부분(20, 21) 사이의 접합부에서 원통형 연장부(18) 상에 형성된다.

[0076] 외향 연장하는 리부(33)가 하단부(12)를 향해 외부 부재(2) 내에 형성된다. 외향 연장하는 리부(33)는 환형 벽(13)과 동축인 2차 벽(15)을 형성하며, 2차 벽(15)과 환형 벽(13) 사이에 메니홀드(16)를 형성하는 환형 트랙을 형성한다. 메니홀드(16)는 외부 부재(2)의 원주 둘레를 둘러싼다. 일련의 슬롯(17)이 외부 부재(2)의 내부(34)와 메니홀드(16) 사이의 기체 및 액체 연통을 제공하도록 메니홀드(16)와 수평을 상태로 환형 벽(13) 내에 제공된다. 도면에 도시된 바와 같이, 슬롯(17)은 환형 벽(13) 내의 수직 돌출물로 형성된다. 20개 내지 40개의 슬롯이 제공된다. 도시된 실시예에서, 37개의 슬롯(17)이 메니홀드(16)의 원주 둘레에 대체로 동일한 간격으로 제공된다. 슬롯(17)은 바람직하게는 1.4 내지 1.6 ㎜의 길이를 갖는다. 전형적으로, 각각의 슬롯의 길이는 외부 부재(2)의 총 높이의 10%를 나타내는 1.6 ㎜이다. 슬롯의 폭은 0.25 내지 0.35 ㎜이다. 전형적으로, 각각의 슬롯의 폭은 0.3 ㎜이다. 슬롯(17)의 폭은 용융 성형이 보완되나 사용하는 동안 그를 통해 메니홀드(16) 내부로 통과하는 것을 방지하기에 충분히 좁다.

[0077] 입구 챔버(26)는 외부 부재(2)의 주변부에서 외부 부재(2) 내에 형성된다. 도면에서 가장 명확하게 도시된 바와 같이, 그 내부의 입구 챔버(26)를 형성하고 외부 부재(2)의 내부(34)로부터 입구 챔버(26)를 밀폐하는 원통형 벽(27)이 제공된다. 원통형 벽(27)은 주축(X)과 수직한 평면 상에 형성된 폐쇄된 상부면(28)과 외부 부재(2)의 하단부(12)와 동일 평면 상의 개방된 하부 단부(29)를 갖는다. 입구 챔버(26)는 도면에 도시된 바와 같이 2개의 슬롯(30)을 거쳐 메니홀드(16)와 연통한다. 대안적으로, 1 내지 4개의 슬롯이 메니홀드(16)와 입구 챔버(26) 사이의 연통을 위해서 사용될 수 있다.

[0078] 외향 연장하는 리부(33)의 하부 단부에는 주축(X)과 수직하게 연장하는 외향 연장하는 플랜지(35)가 제공된다. 전형적으로, 플랜지(35)는 2 내지 4 ㎜의 폭을 갖는다. 플랜지(35)의 일부분은 외부 부재(2)가 보유될 수 있는 캔틸을 형성하도록 확대된다. 캔틸(24)에는 파지를 개선하도록 위로 향한 림(25)이 제공된다.

[0079] 외부 부재(2)는 고밀도 폴리에틸렌, 폴리프로필렌, 폴리스티렌, 폴리에스테르, 또는 이들 재료들 중 2가지 이상의 라미네이트로부터 일체형 다일편으로서 형성된다. 적합한 폴리프로필렌은 DSM UK Limited(영국, 헤더치)로부터 입수할 수 있는 중합체들의 범위이다. 외부 부재는 블루잉, 주형 또는 압출성형될 수 있다. 제조 공정은 사출 성형일 수 있다.

[0080] 도7 내지 도10에 도시된 바와 같은 내부 부재(3)는 환형 프레임(41)과 하향 연장하는 원통형 플래그(40)를 포함한다. 주축(X)은 도면에 도시된 바와 같이 내부 부재(3)의 중심을 통과한다.

[0081] 도에에 가장 잘 도시된 바와 같이, 환형 프레임(41)은 10개의 동일한 간격의 반경방향 스포크(53)에 의해 지지된 외부 림(51)과 내부 허브(52)를 포함한다. 내부 허브(52)는 원통형 플래그(40)와 일체형이고 이로부터 연장한다. 여과 개구(55)가 반경방향 스포크(53)를 사이에서 환형 프레임(41) 내에 형성된다. 플런저(4)가 여과 개구(55)를 밀도를 환형 프레임(41) 상에 배치된다. 필터는 바람직하게는, 예컨대 폴리에스테르의 부직포 섬유 재료와 같은 높은 습윤 강도를 갖는 재료로부터 제조된다. 사용될 수 있는 다른 재료는 직포 종이 섬유를 포함하는 셀룰로오스계 재료와 혼합 셀룰로오스계 재료를 포함한다. 적합한 합성 섬유는 폴리프로필렌, 셀과 폴리비닐 알/또는 폴리에틸렌의 일부의 혼합물 수 있다. 이들 폴리스틱 재료의 셀룰로오스계 재료로의 혼합은 셀룰로오스 재료를 가열 밀봉할 수 있게 한다. 플런저(4)는 또한 열/또는 압력에 의해 활성화되는 재료로 처리 또는 코팅될 수 있다. 환형 프레임(41)에 미리한 방식으로 밀봉될 수 있다.

[0082] 도7의 단면 프로파일로 도시된 바와 같이, 내부 허브(52)는 외부 림(51)보다 낮은 위치에 위치되어, 환형 프레임(41)은 중심선 보다 낮은 프로파일을 갖게 된다.

[0083] 각각의 스포크(53)의 상부면에는 환형 프레임(41) 위의 빈 공간을 복수의 통로(57)로 분할하는 직립 웨브(54)가 제공된다. 각각의 통로(57)는 웨브(54)에 의해 양 측면에 그리고 플런저(4)에 의해 하부단에 경계된다. 통로(57)는 외부 림(51)으로부터 웨브(54)의 내부 말단부에 의해 형성된 개구(56)에서 원통형 플래그(40)를 향해 하향으로 연장하며 그 내부로 개방된다.

[0084] 원통형 플래그(40)는 내부 배출구(discharge spout; 43)를 둘러싸는 외부 튜브(42)를 포함한다. 외부 튜브(42)는 원통형 플래그(40)의 외부를 형성한다. 배출구(43)는 환형 플런저(4)에 의해 배출구(43)의 상부 단부에서 외부 튜브(42)에 결합된다. 배출구(43)는 통로(57)의 개구(56)와 연통하는 상부 단부의 입(45), 및 조제된 음료가 컵 또는 다른 리셉터클로 배출되는 하부 단부의 출구(44)를 포함한다. 배출구(43)는 상부 단부에서 원추형 부분(46), 및 하부 단부에서 원통형 부분(58)을 포함한다. 원통형 부분(58)은 출구(44)를 향해 좁아지도록 약간의 테이퍼를 가질 수 있다. 원추형 부분(46)은 통로에 단차를 형성하지 않고 통로(57)로부터 출구(44)를 향해 아래로의 음료의 제거 형성을 돕는다. 원추형 부분(46)의 상부면에는 원통형 플래그(40)의 원주 둘레로 돌출된 간격으로 이격된 4개의 지지 웨브(49)가 제공된다. 각각의 웨브(49)는 그를 사이에 채널(50)을 형성한다. 지지 웨브(49)의 상부 에지는 서로 같은 높이에 있으며, 주축(X)에 대해 수직하다.

[0085] 내부 부재(3)는 폴리프로필렌 또는 견줄한 재료와 유사한 재료로부터, 외부 부재(2)와 동일한 방식으로 사출 성형에 의해 일체형 단일편으로서 형성될 수 있다.

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[0086] 대안적으로, 내부 부재(3) 및/또는 외부 부재(2)는 생분해성 중합체로부터 제조될 수 있다. 적합한 재료의 예는 물에 가용한 폴리에틸렌(예컨대, 영국 보이셀루즈 소재의 Symphony Environmental에 의해 공급되는 SP-PEK), 생분해성 폴리에스테르 아미드(예컨대, Symphony Environmental에 의해 공급되는 BAK 1095), 폴리 락트산(미국 미네소타 소재의 Cargill에 의해 공급되는 PLA), 전분계(starch-based) 중합체, 셀룰로오스 유도체 및 폴리할리드를 포함한다.

[0087] 라미네이트(5)는 2개의 층, 즉 알루미늄의 제1 층과 캐스트 폴리프로필렌의 제2 층으로 형성된다. 알루미늄 층은 0.02 내지 0.07 ㎜의 두께를 갖는다. 캐스트 폴리프로필렌 층은 0.005 내지 0.064 ㎜의 두께를 갖는다. 셀 성형에서, 알루미늄 층은 0.06 ㎜ 두께이고 폴리프로필렌 층은 0.025 ㎜ 두께이다. 이러한 라미네이트는 복잡 조립되는 동안의 휨(curling)에 대한 높은 저항성을 갖기 때문에 유리하다. 결과적으로, 라미네이트(5)는 정확한 크기와 형상으로 미리 절단될 수 있고, 후속하여 변형을 받지 않고 생산 라인 상의 조립 스테이션으로 전달될 수 있다. 물론적으로, 라미네이트(5)는 폴리에 특히 적합하다. PET/알루미늄/PP, PE/EVOH/PP, PET/금속/PP, 및 알루미늄/PP 라미네이트를 포함하는 다른 라미네이트 재료가 사용될 수도 있다. 물 라미네이트 스톡이 다이 절단 스톡 대신에 사용될 수도 있다.

[0088] 카트리지(1)는 가요성 라미네이트 대신에 강성 또는 반강성 투명에 의해 제공될 수도 있다.

[0089] 카트리지(1)의 조립은 하기의 단계를 수반한다.

[0090] a) 내부 부재(3)가 외부 부재(2) 내로 삽입되는 단계,

[0091] b) 필터(4)가 형상에 맞게 절단되고 내부 부재(3) 상에 배치되며, 원통형 플레그(40) 위로 수용되고 분쇄 프레임에 대해 안착되는 단계,

[0092] c) 내부 부재(3), 외부 부재(2) 및 필터(4)가 초음파 용접에 의해 결합되는 단계,

[0093] d) 카트리지(1)가 하나 이상의 음료 성분으로 충전되는 단계,

[0094] e) 라미네이트(5)가 외부 부재(2)에 부착되는 단계.

[0095] 이들 단계는 이하에서 더욱 상세하게 논의될 것이다.

[0096] 외부 부재(3)는 개방 하단부(12)가 위로 향한 상태로 배향된다. 그 후, 내부 부재(2)가, 외부 림(51)의 카트리지(1)의 상단부(11)에서 측방향 연장부(14) 내에 밀접하게 끼워지도록 수용되는 상태로, 외부 부재(2) 내에 삽입된다. 동시에, 외부 부재(2)의 원통형 연장부(18)는 내부 부재(3)의 원통형 플레그(40)의 상부 부분 내에 수용된다. 원통형 연장부(18)의 제3 부분(21)은, 원통형 연장부(18)의 확장된 하부면(31)이 내부 부재(3)의 지지 웨브(49)에 대향하여 지지되는 상태로, 원통형 플레그(40) 내측에 끼워진다. 그 후, 필터(4)는 필터 재료가 환형 림(51)과 접촉하도록 내부 부재(3) 위에 배치된다. 그리고 나서, 초음파 용접 공정이 필터(4)를 내부 부재(3)에 결합시키고 동시에 둘레의 공정 단계에서 내부 부재(3)를 외부 부재(2)에 결합하도록 사용된다. 내부 부재(3)와 필터(4)는 외부 림(51) 둘레에서 용접된다. 내부 부재(3)와 외부 부재(3)는 외부 림(51) 둘레와, 또한 웨브(54)의 상부 에지의 용접선에 의해 결합된다.

[0097] 도1에 가장 명확하게 도시된 바와 같이, 외부 부재(2)와 내부 부재(3)는 함께 결합된 후, 환형 통로(41) 아래의 내부(120) 및 여과 챔버를 형성하는 원통형 결합기(40)의 외부 내에 빈 공간(130)을 형성한다. 여과 챔버(130)와 환형 프레임(41) 상의 홈(57)은 필터지(4)에 의해 분리된다.

[0098] 여과 챔버(130)는 하나 이상의 음료 성분(200)을 포함한다. 하나 이상의 음료 성분이 여과 챔버(130) 내에 제공된다. 여과 유형 음료의 경우, 성분은 전형적으로 볶고 분쇄된 커피 또는 잎차이다. 여과 챔버(130) 내의 음료 성분의 채움 밀도는 용도에 따라 변경될 수 있다. 전형적으로, 여과된 커피 제품의 경우, 여과 챔버는 전형적으로 5 내지 14 ㎜ 두께의 여과 배드(bed) 내에 5.0 내지 10.2 그램의 볶고 분쇄된 커피를 함유한다. 참조로, 외부(120)는 음료가 배출되는 동안 음료 성분의 침전물에 난류를 발생하여 교란시킴으로써 혼합을 보조하도록 내부(120)에서 자유롭게 이동할 수 있는, 구체(sphere)와 같은 하나 이상의 물체를 포함할 수 있다.

[0099] 그 후, 라미네이트(5)는 외향 연장하는 플랜지(35)의 하부 표면에 라미네이트(5)를 결합하도록 라미네이트(5)의 주변부 둘레에 용접부(125)를 형성함으로써 외부 부재(2)에 부착된다. 용접부(125)는 라미네이트(5)를 입구 챔버(26)의 원통형 벽(27)의 하부 에지에 대향하여 밀봉하도록 연장된다. 또한, 용접부(125)는 라미네이트(5)의 원통형 결합기(40)의 외부 튜브(42)의 하부 에지 사이에 형성된다. 라미네이트(5)는 여과 챔버(130)의 하부 벽을 형성하고, 또한 입구 챔버(26)와 원통형 결합기(40)를 밀봉한다. 그리고, 작은 간격(123)이 분배 전에 라미네이트(5)와 배출구(43)의 하부 에지 사이에 존재한다. 라미네이트(5)의 재료 특성에 따라, 열과 초음파 용접과 같은 다양한 용접 방법이 사용될 수도 있다.

[0100] 유리하게는, 내부 부재(3)는 외부 부재(2)와 라미네이트(5) 사이에 결합 된다. 내부 부재(3)는 폴리프로필렌과 같은 비교적 강성의 재료로부터 형성된다. 이와 같이, 내부 부재(3)는 카트리지(1)가 압축된 때 라미네이트(5)와 외부 부재(2)를 이격된 상태로 유지하도록 작용하는 하중 지지 부재를 형성한다. 카트리지(1)는 사용시 130 내지 280 N의 압축 하중을 받는 것이 바람직하다. 압축력은 카트리지가 내부 가압 상태 하에서 파손되는 것을 방지하도록 작용하며, 또한 내부 부재(3)와 외부 부재(2)를 함께 압착하도록 작용한다. 이는 카트리지(1) 내의 물질와 개구의 내부 치수가 고정되며 카트리지(1)가 가압 상태 중에 변경될 수 없게 하는 것을 보장한다.

[0101] 카트리지(1)를 사용하기 위하여, 카트리지는 먼저 음료 조제 기계 내로 삽입되고, 입구(12)와 출구(122)는 라미네이트(5)를 관통시켜 찔러 넣는, 음료 조제 기계의 천공 부재에 의해 개방된다. 가압 하의 수성 매체, 전형적으로는 물이 입구(12)를 통해 입구 챔버(26)로 0.1 내지 2.0 bar의 압력에서 카트리지(1)로 전달된다. 여기로부터, 물은 슬롯(30)을 통해 매니폴드(16) 둘레로 그리고 복수의 슬롯(17)을 통해 카트리지(1)의 여과 챔버(130) 내부로 유동하도록 안내된다. 물은 여과 챔버(130)를 통해 반경방향 내향으로 강제로 유동되며, 내부에 함유된 음료 성분(200)과 혼합된다. 동시에, 물은 음료 성분을 통과하며 상향으로 강제로 유동된다. 음료 성분을 통한 물의 통과에 의해 조제된 음료는 필터(4)와 여과 개구(55)를 통해

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환형 프레임(41) 쪽에 놓인 통로(57) 내부로 통과한다. 필터(4)의 스포크(53) 상으로의 일정과 컵(51)의 외부 부재(2)와의 융합은 좋단 없이 모든 음료가 필터(4)를 통과하는 것을 보장한다.

[0102] 그러면, 음료는 웨브(54)를 사이에 형성된 반경방향 통로(57)를 따라 개구(56)를 통해 원통형 챔버(40) 내부로 하향으로 유동한다. 음료는 지지 웨브(47)를 사이의 채널(50)를 따라 그리고 배출구(43)로부터 음료가 합과 같은 리셉터를 내부로 배출되는 출구(44)까지 아래로 통과한다.

[0103] 바람직하게는, 음료 조제 기계는 압축된 공기가 남아 있는 음료를 리셉터를 내부로 분출시키도록 분배 주기의 마지막에서 카트리지(1)를 통해 가압되는 공기 정화 설비를 포함한다.

[0104] 카트리지(1)의 제2 형태는 도12 내지 도16에 도시되어 있다. 카트리지(1)의 제2 실하는 특히 크레마(crema)로 알려진 작은 기포들의 거품을 갖는 음료를 조제하는 데에 바람직한, 볶고 분쇄된 커피와 같은 에스프레소 유형 제품을 분배하는 데에 사용되도록 설계된다. 카트리지(1)의 제2 형태의 많은 특징부분은 제1 형태와 동일하고, 유사한 도면 부호가 유사한 특징부를 참조하도록 사용된다. 하기의 설명에서, 제1 및 제2 형태 사이의 차이점이 논의될 것이다. 동일한 방식으로 기능하는 공통되는 특징부들은 상세히 논의되지는 않을 것이다.

[0105] 외부 부재(2)는 도1 내지 도6에 도시된 바와 같은 카트리지(1)의 제1 형태와 동일한 구성을 갖는다.

[0106] 내부 부재(3)의 환형 프레임(41)은 제1 형태에서와 동일하다. 또한, 필터(4)는 여과 개구(55)를 덮도록 환형 프레임(41) 상에 배치된다. 원통형 챔버(40)의 외부 튜브(42)는 또한 제1 형태와 동일하다. 그러나, 제1 형태와 비교하여 제2 형태의 내부 부재(2)의 구성에서 많은 차이가 있다. 도16에 도시된 바와 같이, 배출구(43)에는 출구(44)로부터 배출구(43)까지 부분적으로 위로 연장하는 격벽(65)이 제공된다. 격벽(65)은 음료가 배출구(43)를 통과하고 때 분무 및/또는 튀는 것을 방지하는 것을 돕는다. 배출구(43)의 프로파일은 역시 상이하며, 튜브(43)의 상부 단부에 인접한 루멘한 도그레그(dog-leg: 66)를 갖는 단차형 프로파일을 포함한다.

[0107] 컵(67)은 원형 플랜지(47)로부터 직립하여 제공되며, 외부 튜브(42)를 배출구(43)에 결합시킨다. 컵(67)은 입구(45)를 배출구(43)까지 둘러싸고, 컵(67)과 외부 튜브(42)의 상부 부분 사이의 환형 채널(69)이 형성된다. 컵(67)에는 내향 견부(68)가 제공된다. 컵(67)의 원주 둘레의 일 지점에서, 개구(70)는 도12 및 도16에 가장 명확하게 도시되어 있는 바와 같이 컵(67)의 상부 에지로부터 견부(68)의 높이 아래의 거리의 지점까지 연장하는 슬롯의 형태로 제공된다. 슬롯은 0.64 ㎟의 폭을 갖는다.

[0108] 공기 입구(71)는 도16 및 도17에 도시된 바와 같이 환형 플랜지(47) 내에 개구(70)와 원주방향으로 정렬되어 제공된다. 공기 입구(71)는 플랜지(47) 위의 일 지점과, 외부 튜브(42)와 배출구(43) 사이의 플랜지(47) 아래의 한 점간 사이의 연통을 제공하도록 플랜지(47)를 통과하는 개구를 포함한다. 바람직하게는, 도시된 바와 같이, 공기 입구(71)는 상부 원주형 부분(73)과 하부 원통형 부분(72)을 포함한다. 공기 입구(71)는 전형적으로 펀과 같은 성형 공구에 의해 형성된다. 공기 입구(71)의 테이퍼진 프로파일은 성형 공구가 성형된 구멍 요소로부터 뽑아 올이하게 제거될 수 있게 한다. 공기 입구(71) 부근의 외부 튜브(42)의 벽은 공기 입구(71)로부터 배출구(43)의 입구(45)까지 테이퍼지는 슈트(chute: 75)를 형성하도록 형성된다. 도17에 도시된 바와 같이, 견부(74)가 슈트(75)으로부터 유출되는 음료의 부분을 배출구 공기 입구(71)에 바로 인접한 부분에서 플랜지(47)의 상부 표면 상을 바로 막히게 하지 않는 것을 보장하도록, 공기 입구(71)와 슈트(75) 사이에 형성된다.

[0109] 카트리지(1)의 제2 형태를 위한 조립 절차는 제1 형태의 조립과 유사하다. 그러나, 소정의 차이점이 있다. 도16에 도시된 바와 같이, 원통형 연장부(18)의 제3 부분(21)은 지지 웨브에 대응하기보다는 지지 컵(67) 내측에 놓여진다. 제2 부분(20)과 제3 부분(21) 사이의 원통형 연장부(18)의 견부(32)는 내부 부재(3)의 지지 컵(67)의 상부 에지에 대향하여 지지된다. 그러므로, 원통형 연장부(18)와 카트리지(1)의 전체 원주 둘레에 인접하게 연장하는 지지 컵(67) 사이의 용접 시일(face seal)을 포함하는 경계 구역(124)이 내부 부재(3)와 외부 부재(2) 사이에 형성된다. 원통형 연장부(18)와 지지 컵(67) 사이의 시일은, 지지 컵(67) 내의 슬롯(70)이 지지 컵(67)을 통해 견부(68) 아래의 가장자리 지점까지 하향으로 연장하기 때문에, 유체 기밀되지 않는다. 결과적으로, 원통형 연장부(18)와 지지 컵(67) 사이의 경계면 피복을 도16에 가장 명확하게 도시된 바와 같이 슬롯(70)을 개구(128)로 변형시켜, 환형 채널(69)과 통출구(43) 사이의 기체 연통을 제공한다. 개구는 전형적으로 0.64 ㎟ 폭과 0.66 ㎟ 길이를 갖는다.

[0110] 음료를 분배하기 위한 카트리지(1)의 제2 형태의 작동은 제1 형태의 작동과 유사하다. 소정의 차이점이 있다. 반경방향 통로(57) 내의 음료는 웨브(54)를 사이에 형성된 통로(57)를 따라 하향으로 그리고 개구(56)를 통해 원통형 챔버(40)의 환형 채널(69) 내부로 유동한다. 환형 채널(69)로부터, 음료는 여과 챔버(130)와 통로(57) 내에 수집된 음료의 부압에 의해 개구(128)를 통해 가압 하에 갑재로 유동된다. 그러므로, 음료는 분출됨으로써 개구(128)를 통해 배출구(43)의 상부 단부에 의해 형성된 형상 챔버 내부로 갑재로 유동된다. 도16에 도시된 바와 같이, 음료의 분출물은 공기 입구(71) 위로 직접 통과한다. 음료가 배출구(43)로 전입함에 따라, 음료 분출물의 압력은 하강된다. 결과적으로, 공기가 공기 입구(71)를 통과한 다음에서 다수의 작은 기포의 형태로 음료 스트림 내로 혼입된다. 개구(128)로부터 유출되는 음료의 분출물은, 기포가 요구되는 크레마를 형성하는 데에 필요한 리셉터를 내부로 음료가 배출되는 출구(44)를 향해 하향으로 유동한다. 그러므로, 개구(128)와 공기 입구(71)는 함께 공기를 음료 내로 분산하도록 작용하는 이덕터(eductor)를 형성한다. 이덕터 내부로의 음료의 유동은 압력 손실을 감소시키기 위하여 가능한 한 부드럽게 유지되어야 한다. 유리하게는, 이덕터의 벽은 "벽 효과"(wall effect) 마찰에 의한 손실을 감소시키도록 오목하여야 한다. 개구(128)의 치수 공차는 작다. 바람직하게는, 개구 크기는 ±0.03 ㎟'으로 고정된다. 컵, 미세섬유 또는 기타 표면 물구적한 부분의 유효 단면적을 증가시키도록 이덕터 내에 또는 그의 배출구에 제공될 수 있으며, 이는 공기 혼입의 정도를 증가시키는 것으로 확인되었다.

[0111] 카트리지(1)의 제3 형태가 도18 내지 도20에 도시되어 있다. 카트리지(1)의 제3 형태는 특히 분말, 액체, 시럽, 겔 또는 유사한 형태일 수 있는 가용성(soluble) 제품의 분배에 사용되도록 설계된다. 가용성 제품은 사용시 물과 같은 수성 매체가 카트리지(1)를 통과할 때 수성 매체에 의해 용해되거나 수성 매체 내에 현탁물을 형성한다. 음료의 예는 소콜릿, 커피, 우유, 차, 수프, 또는 기타 재수화될 수 있거나 수용성인

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제품을 포함한다. 카트리지(1)의 제3 형태의 몇몇 특징부는 이전의 형태와 동일하며, 유사한 도면 부호가 유사한 특징부를 참조하도록 사용된다. 하기의 설명에서, 제3 형태와 이전의 형태 사이의 차이가 논의될 것이다. 동일한 방식으로 기능하는 공통적인 특징부들은 상세히 설명되지 않을 것이다.

[0113] 이전 형태의 외부 부재(2)와 비교하면, 제3 형태의 외부 부재(2)의 종방향 내향 치수는 도2b에 도시된 바와 같이 보다 큰 총 직경을 갖는다. 특히, 제1 부분(19)의 직경은 전형적으로 이전 형태의 외부 부재(2)의 경우 13.2 ㎜인 것과 비교하여 16 내지 18 ㎜이다. 또한, 제1 부분(19)에는 도2b에 가장 명확하게 도시된 바와 같이, 볼록한 외부 표면(19a) 또는 벌지(bulge)가 제공된다. 그러나, 카트리지(1)의 제3 부분(21)의 직경은 동일하며, 견부(32)의 위치는 카트리지(1)의 이전의 제3 형태에서 보다 크게 된다. 전형적으로, 카트리지(1)의 부피는 조립할 때 30.5 ml ±2ml이다.

[0114] 환형 벽(13)의 하부 단부 내의 슬롯의 개수와 위치 또한 상이하다. 3개 내지 5개의 슬롯이 제공된다. 도2b에 도시된 바와 같은 실시예에서, 4개의 슬롯(36)이 매니폴드(19)의 원주 둘레에 동일한 간격으로 제공된다. 슬롯(36)은 카트리지(1)의 이전의 형태보다 약간 넓은 0.35 내지 0.45 ㎜, 바람직하게는 0.4 ㎜의 폭을 갖는다.

[0115] 다른 점에서는, 카트리지(1)의 외부 부재(2)는 동일하다.

[0116] 내부 부재(3)의 원통형 결합기(40)의 구성은 외부 부재(42), 배출구(45), 환형 플랜지(47) 및 지지 웨브(48)가 제공되는 카트리지(1)의 제1 형태와 동일하다. 차이점은 단지 배출구(45)가 상부 원추형 섹션(52)과 하부 원통형 섹션(53)을 갖도록 형상화된다는 것이다.

[0117] 이전 형태와 비교하면, 도24 내지 도28에 도시된 바와 같이, 환형 프레임(41)은 원통형 결합기(40)를 둘러싸고 환형 플랜지(47)에서 또는 그 부근에서 원통형 결합기(40)에 결합된 8개의 반경방향 스트럿(strut; 97)에 의해 결합기에 결합되는 스커트 부분(80)에 의해 대체된다. 스커트 부분(80)의 원통형 연장부(81)는 개방 상부단을 갖는 챔버(90)를 형성하도록 스트럿(97)으로부터 상향으로 연장된다. 원통형 연장부(81)의 상부 림(91)은 도2b에 도시된 바와 같이 내향 프로파일을 갖는다. 스커트 부분(80)의 환형 섹션(82)은 스커트 부분(80)과 외부 웨브(42) 사이의 환형 채널(86)을 형성하도록 스트럿(97)으로부터 하향으로 연장된다.

[0117] 환형 섹션(82)은 주축(X)과 수직하게 놓이는 외부 플랜지(82)를 하부 단부에서 포함한다. 림(84)은 플랜지(83)의 하부 표면으로부터 하향으로 연수되고, 림(84) 둘레에서 원주방향으로 동일한 간격으로 배치된 8개의 개구(85)를 포함한다. 그러므로, 림(84)에는 성 형상(castellated)의 하부 프로파일이 제공된다.

[0118] 개구(89)는 스트럿(87)을 사이에 제공되어, 챔버(90)와 환형 채널(86) 사이의 연통을 허용한다.

[0119] 카트리지(1)의 제3 형태를 위한 조립 절차는 제1 형태의 조립과 유사하지만, 소정의 차이가 있다. 외부 부재(2)와 내부 부재(3)는 도2b에 도시된 바와 같이 함께 놓인 채 끼워지고, 함께 용접되거나 본드 또는 기타 수단에 의해 부착된다. 2개의 부재를 결합할 때, 내향 원통형 연장부(18)는 스커트 부분(80)의 상부 원통형 연장부(81) 내측에 수용된다. 내부 부재(3)는 원통형 연장부(18)의 제1 부분(19)의 볼록한 외부 표면(19a)과 상부 원통형 연장부(81)의 내향 림(91)과의 마찰 결합에 의해 외부 부재(2) 내에 보유된다. 내부 부재(3)를 외부 부재(2) 내에 위치시킴으로써, 혼합 챔버(134)는 스커트 부분(80)에 대해 외부에 위치된 부분을 형성한다. 혼합 챔버(134)는 부피에 있어 음료 성분(200)을 보유한다. 4개의 입구(36)와 5개의 개구(85)가 서로에 대해 원주방향으로 엇갈리게 배치된다는 것에 주목하여야 한다. 서로에 대한 2개의 부분의 반경방향 배치가 조립되는 동안에 결정되거나 고정될 필요는 없는데, 이는 4개의 입구(36)와 5개의 개구(85)가 구성 요소들의 상대적인 최종 위치설정에 관계 없이 입구와 개구 사이의 오정렬이 발생할 것을 보장하기 때문이다.

[0120] 하나 이상의 음료 성분이 카트리지의 혼합 챔버(134) 내에 제공된다. 혼합 챔버(134) 내의 음료 성분의 체를 필요로 할 수 있다.

[0121] 그 후, 래미네이트(6)가 이전 형태에서 설명된 바와 동일한 방식으로 외부 부재(2)와 내부 부재(3)에 부착된다.

[0122] 사용시, 물은 카트리지의 이전 형태와 동일한 방식으로 4개의 슬롯(36)을 통해 혼합 챔버(134)로 전달된다. 물은 혼합 챔버를 통해 반경방향 내향으로 가압되고, 내부에 함유된 음료 성분과 혼합된다. 제품은 물로 용해되거나 미분 혼합되며, 혼합 챔버(134) 내에서 음료를 조제한다. 그 후 개구(85)를 통해 혼합 챔버(134) 내의 음료와 물의 부피에 의해 전방 채널(86) 내부로 이동된다. 4개의 입구 슬롯(36)과 5개의 개구(85)의 원주방향 엇갈림은 물이 분출물이 혼합 챔버(134) 내에서 먼저 순환되지 않고 입구 슬롯(36)으로부터 개구(85)로 반경방향으로 직접 통과될 수 없게 하는 것을 보장한다. 이러한 방식에서, 제품의 용해 또는 혼합의 정도와 주도(consistency)는 상당히 증가한다. 음료는 스트럿(87)을 사이의 개구(89)를 통해 챔버(90) 내부로 환형 채널(86) 내에서 상향으로 강제로 유동된다. 음료는 챔버(90)로부터 지지 웨브(48)를 사이의 입구(45)를 통해 배출구(43) 내부로 그리고 용기 캡과 같은 리셉터를 내부로 통과되는 출구(44)를 향해 통과한다. 카트리지는 특히 점성 액체 또는 겔 형태의 음료 성분에 적용될 수 있는 것으로 확인되었다. 하나의 적용예에서, 점성 초콜릿 음료는 대기 온도에서 1700 내지 2600 mPa의 점도로, 그리고 0℃에서 5000 내지 10000 mPa의 점도로, 그리고 67 brix 초과의 물질 고형분(refractive solid)으로 카트리지(1) 내에 함유된다. 다른 적용예에서, 액상 커피는 대기 온도에서 70 내지 2000 mPa의 점도로, 그리고 0℃에서 80 내지 5000 mPa의 점도로 카트리지(1) 내에 함유된다. 이 경우 커피는 40 내지 70%의 총 고형분 수준을 갖는다.

[0123] 카트리지(1)의 제4 형태가 도30 내지 도34에 도시되어 있다. 카트리지(1)의 제4 형태는 특히 농축된 액상 우유와 같은 액상 제품을 분배하는 데에 사용되도록 설계된다. 카트리지(1)의 제4 형태의 많은 특징부는 이전 형태와 동일하며, 유사한 도면 부호가 유사한 특징부를 참조하도록 사용된다. 하기의 설명에서, 제4 형태와 이전 형태들 사이의 차이점이 논의될 것이다. 동일한 방식으로 기능하는 공통적인 특징부들은 상세히 논의되지 않을 것이다.

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[0124] 외부 부재(2)는 도19 내지 도23에 도시된 바와 같은 카트리지(1)의 제3 형태와 동일하다.

[0125] 내부 부재(3)의 원통형 돌출기(40)는 카트리지(1)의 제2 형태에서 도시된 것과 유사하지만, 소정의 차이점이 있다. 도33에 도시된 바와 같이, 배출구(43)는 상부 원추형 섹션(106)과 하부 원통형 섹션(107)을 갖도록 형상화된다. 3개의 축방향 리브(rib; 105)가 분배되는 음료를 입구(44)를 향해 하방으로 안내하고 배출된 음료가 배출구 내에서 맴도는 것을 방지하도록 배출구(43)의 내부 표면 상에 제공된다. 결과적으로, 리브(105)는 배플(baffle)로서 작용한다. 카트리지(1)의 제2 형태에서와 같이, 공기 입구(71)는 환형 홈편자(47)를 통해 제공된다. 그러나, 공기 입구(71) 아래의 슈트(75)는 제2 형태에서보다 더 짧다.

[0126] 스커트 부분(80)은 전술된 카트리지(1)의 제3 형태에서 도시된 것과 유사하게 제공된다. 5개 내지 12개의 개구(85)가 밀(84) 내에 제공된다. 전형적으로, 카트리지(1)의 제3 형태에서 제공된 6개보다는 10개의 개구가 제공된다.

[0127] 환형 보울(100)이 스커트 부분(80)의 홈편자(83)로부터 연장하여 이와 일체형으로 제공된다. 환형 보울(100)은 상당히 깊은 상부 마우스(mouth; 104)를 갖는 볼록한 표체(101)를 포함한다. 도30 및 도31에 도시된 바와 같은 4개의 공급 개구(103)가, 스커트 부분(80)이 결합되는 보울(100)의 하부 단부에 또는 그 부근에서 본체(101) 내에 배치된다. 바람직하게는, 공급 개구는 보울(100)의 원주 둘레에 동일 간격으로 배치된다.

[0128] 라미네이트(5)는 이전 실시예에서 전술된 종류의 것이다.

[0129] 카트리지(1)의 제4 형태를 위한 조립 절차는 제3 형태를 위한 조립과 동일하다.

[0130] 카트리지의 제4 형태의 작동은 제3 형태의 작동과 유사하다. 물은 이전과 동일한 방식으로 카트리지(1)와 혼합 챔버(134)로 전달된다. 여기서, 물은 액상 재료와 혼합되어 희석되며, 그 후 개구(85)를 통해 전술된 바와 같이 출구(44)를 향해 상승 가압된다. 소정 비율의 액상 재료는 도34에 도시된 바와 같은 환형 보울(100) 내에 잔류되고, 혼합 챔버(134) 내로 전달하는 물에 의해 바로 희석되지 않는다. 혼합 챔버(134)의 하부 부분 내의 희석된 액상 재료는 상부 마우스(104)를 통해 환형 보울(100) 내로 가압되기보다는 개구(85)를 통해 빠져나가기 쉬울 것이다. 결과적으로, 환형 보울(100) 내의 액상 재료는 혼합 챔버(134)의 하부 부분 내의 재료와 비교하여 상대적으로 농축된 상태로 유지될 것이다. 환형 보울(100) 내의 액상 재료는 개구(85)를 통해 혼합 챔버(134)를 빠져나가는 재료의 스트림 내로 공급 개구(103)를 통해 방출된다. 환형 보울(100)은, 소정 비율의 농축된 액상 재료를 보유하고 이를 물에 추가 전체에 걸쳐 보다 부드럽게 빠져나오는 액체 스트림 내로 방출함으로써 원통형 돌출기(40)로 전달하는 희석된 액상 재료의 농도를 고르게 유지하도록 기능한다.

[0131] 환형 채널(86)로부터, 음료는 이과 챔버(134)와 챔버(30) 내에 수집되는 음료의 부압에 의해 개구(128)를 통해 가압 하에서 강제로 유동된다. 그러므로, 음료는 분출물로서 개구(128)를 통해 그리고 배출구(43)의 상부 단부에 의해 형성된 챔버 내로 가압된다. 도34에 도시된 바와 같이, 음료의 분출물은 공기 입구(71) 쉬로 직접 통과한다. 음료가 배출구(43)로 진입함에 따라, 음료 분출물의 압력은 하강한다. 결과적으로, 공기가 공기 입구(71)를 통과하면서 다수의 작은 기포의 형태로 음료 스트림 내로 혼입된다. 거품은 다수의 작은 기포의 형태로 공기 입구(71)를 거쳐 음료 스트림 내로 혼입된다. 개구(128)로부터 분출되는 음료의 분출물은, 기포가 음료에는 거품 형상을 생성하는 얇과 같은 리셉터클 내부로 음료가 배출되는 입구(44)로 하향으로 모이게 된다.

[0132] 유리하게는, 내부 부재(3), 외부 부재(2), 라미네이트(5) 및 필터(4)는 모두 구성 요소들이 분리될 수 있고 비용이 들로 부품 품을 개별적으로 포함하지 않기 때문에 쉽게 소독될 수 있다. 또한, 구성 요소들이 재활용되어 소독될 목적만 필요한 물로가 형성될 수 있다. 이는 특히 음료 성분이 액상 우유 농축액과 같은 유제품인 경우에 특히 중요하다.

[0133] 음료 카트리지의 제4 실시예는 특히 액상 우유와 같은 농축된 액상 유제품을 분배하는 데에 유리하다. 이 경우는, 분말 우유 제품이 미리 준비된 음료에 첨가되는 건분 형태로 제공되어 왔다. 그러나, 거부적인 음료의 경우, 우유에 거품을 생성하는 것이 필요하다. 이는 이전에는 액상 우유 제품을 통해 공기를 통과시킴으로써 달성되어 왔다. 그러나, 이는 음료를 분배하는 데에 사용되는 기계의 비용과 복잡성을 증가시키는 공기 공급원을 제공할 것을 필요로 한다. 증기의 사용은 또한 카트리지의 작동 중의 부산물의 처리를 증가시킨다. 따라서, 본 발명은 내부의 농축된 액상 유제품을 갖는 음료 카트리지를 위하여 제공된다. 우유 제품을 농축시킴으로써, 생우유(fresh milk) 또는 UHT 우유와 비교할 때 특정 부피의 우유에 대하여 더 많은 양의 거품이 생성될 수 있음이 확인되었다. 이는 우유 카트리지에 대해 요구되는 크기를 감소시킨다. 생탈지우유(fresh semi-skimmed milk)는 대략 1.6%의 지방과 10%의 총 고형분을 함유한다. 농축된 액상 우유는 3 내지 10%의 지방과 25 내지 40%의 총 고형분을 함유한다. 전형적인 예에서, 조제품은 4%의 지방과 30%의 총 고형분을 함유한다. 농축된 우유 조제품은 이하에서 설명될 계량 조제 기계를 사용하여 거품을 생성하는 데에 적합하다. 특히, 우유의 거품은 2 bar 이상, 바람직하게는 대략 1.5 bar의 압력에서 전술된 제4 실시예의 카트리지를 사용하여 달성된다.

[0134] 제4 실시예의 카트리지는 또한 액상 커피 제품을 분배하는 데에 유리하다.

[0135] 본 발명의 음료 카트리지의 실시예는 종래의 카트리지와 비교할 때 분배된 음료의 개선된 주도를 제공하는 것으로 확인되었다. 이하의 표 1을 참조하면, 볶고 분쇄된 커피를 함유하는 각각의 카트리지 A와 B의 관계 샘플을 대상 추출 산출량의 결과가 도시되어 있다. 카트리지 A는 본 발명의 제1 실시예에 따른 음료 카트리지이다. 카트리지 B는 본 출원인의 특허 출원의 국제 특허 공보 WO 01/58786호에 설명된 바와 같은 종래 기술의 음료 카트리지이다. 추출된 음료의 굴절률(refractive index)은 Brix 단위로 측정되며, 기존의 방식을 사용하여 가용성 고형분의 백분율(%)로 변환된다. 그 예는 다음과 같다.

[0136] [표 1]

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[0139] <카트리지 A>

샘플	추출 수율(%)	추출 강도(g)	pH	추출 시간	추출량
1	20.5	2.4	1.98	1.98	40.59
2	19.84	2.4	1.94	1.94	40.59
3	19.84	2.4	1.95	1.94	40.59
4	19.84	2.4	1.93	1.94	40.59
5	19.84	2.4	1.93	1.94	40.59
6	19.84	2.4	1.95	1.94	40.59
7	19.84	2.4	1.95	1.94	40.59
8	19.84	2.4	1.95	1.94	40.59
9	19.84	2.4	1.95	1.94	40.59
10	19.84	2.4	1.95	1.94	40.59
11	19.84	2.4	1.95	1.94	40.59
12	19.84	2.4	1.95	1.94	40.59
13	19.84	2.4	1.95	1.94	40.59
14	19.84	2.4	1.95	1.94	40.59
15	19.84	2.4	1.95	1.94	40.59
16	19.84	2.4	1.95	1.94	40.59
17	19.84	2.4	1.95	1.94	40.59
18	19.84	2.4	1.95	1.94	40.59
19	19.84	2.4	1.95	1.94	40.59
20	19.84	2.4	1.95	1.94	40.59
평균				1.94	

[0140]

[0141] <카트리지B>

샘플	추출 수율(%)	추출 강도(g)	pH	추출 시간	추출량
1	19.84	2.4	1.95	1.94	40.59
2	19.84	2.4	1.94	1.94	40.59
3	19.84	2.4	1.95	1.94	40.59
4	19.84	2.4	1.94	1.94	40.59
5	19.84	2.4	1.93	1.94	40.59
6	19.84	2.4	1.95	1.94	40.59
7	19.84	2.4	1.95	1.94	40.59
8	19.84	2.4	1.95	1.94	40.59
9	19.84	2.4	1.95	1.94	40.59
10	19.84	2.4	1.95	1.94	40.59
11	19.84	2.4	1.95	1.94	40.59
12	19.84	2.4	1.95	1.94	40.59
13	19.84	2.4	1.95	1.94	40.59
14	19.84	2.4	1.95	1.94	40.59
15	19.84	2.4	1.95	1.94	40.59
16	19.84	2.4	1.95	1.94	40.59
17	19.84	2.4	1.95	1.94	40.59
18	19.84	2.4	1.95	1.94	40.59
19	19.84	2.4	1.95	1.94	40.59
20	19.84	2.4	1.95	1.94	40.59
평균				1.94	

[0142]

[0143] 위의 데이터에 대한 t-실험 통계 분석을 수행하며, 아래의 결과가 주어진다.

[0144] [표 2]

[0145] t-실험 : 동일 분산으로 가정한 2개의 샘플

	추출 수율(%)	추출 강도(g)
평균	20.08	2.08
분산	0.27	1.08
관측	20	20
피어슨 상관	0	
가설 평균 차	0	
df	19	
t Stat	0.00	
P(T<=t) 단측	0.499999	
t 단측 임계	1.729	
P(T<=t) 양측	0.999999	
t 양측 임계	2.093	

[0146]

[0147] 분석은 본 발명의 카트리지에 대한, 추출 강도(brew strength)와 동등한 z 산출량의 주도가 (동일 산화도 수준에서) 종래 기술보다 상당히 양호하며 2.24와 비교하여 0.66처럼 표준 편차를 갖는 것을 보여준다. 이는 본 발명의 카트리지에 의해 추출된 음료가 보다 반복될 수 있고 균일한 강도를 갖는다는 것을 의미한다. 이는 음료가 항상 동일한 맛을 갖고 추출 강도가 임의로 변경되는 것을 원하지 않는 소비자에게 바람

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적하다.

[0148] 전술한 카트리지의 재료에는 산소 및/또는 수분 및/또는 다른 오염원의 진입에 대한 저항성을 개선하기 위하여 차단 코팅이 제공될 수 있다. 차단 코팅은 또한 카트리지 내로부터의 음료 성분의 누출에 대한 저항성을 개선하고 및/또는 음료 성분에 악영향을 미칠 수 있는 카트리지 재료로부터의 추출물의 가능가능성을 감소시킬 수 있다. 차단 코팅은 PET, 폴리아미드, EVOH, PVDC 또는 금속 재료로 구성된 그룹으로부터 선택된 재료일 수 있다. 차단 코팅은 비제한적으로 증기 증착, 전공 증착, 플라즈마 코팅, 공압출, 주입내 라벨링 및 2단단 성형을 포함하는 다수의 기구에 의해 인가될 수 있다.

[0149] 전술한 음료 카트리지와 함께 사용하기 위한 본 발명에 따른 음료 조제 기계(201)가 도35 내지 도45에 도시되어 있다. 음료 조제 기계(201)는 일반적으로, 물 탱크(220)를 포함하는 하우징(210), 물 히터(225), 물 펌프(230), 공기 압축기(235), 제어 프로세서, 사용자 인터페이스(240), 및 카트리지 헤드(250)를 포함한다. 카트리지 헤드(250)는 일반적으로 사용시 보유를 위한 카트리지 홀더(251), 음료 카트리지(1), 카트리지 인식 수단(252), 및 사용시 음료 카트리지(1) 내에 입구(121)와 출구(122)을 형성하기 위한 입구와 출구 천공부(253, 254)를 차례로 포함한다.

[0150] 하우징(210)은 기계(201)의 다른 구성 요소를 제위치에 보유 및 유지한다. 하우징(210)은 바람직하게는 세정과 같은 공업 플라스틱 재료로부터 전체적으로 또는 부분적으로 제조된다. 대안적으로, 하우징(210)은 스테인레스강 또는 알루미늄과 같은 금속 재료로 전체적으로 또는 부분적으로 제조될 수 있다. 하우징(210)은 바람직하게는 조립되는 동안 기계(210) 구성 요소의 설치를 위한 접근을 허용하고 이후에 하우징(210)의 내부(213)를 밀폐하도록 함께 결합되는 전면 절반부(211)와 후면 절반부(212)를 갖는 조계립을 다지원을 포함한다. 후방 절반부(212)는 물 탱크(220)의 부착을 위한 리세스(214)를 제공한다. 하우징(210)에는 기계(201)의 구성 요소를 별도의 세시를 필요로 하지 않고 제위치에 보유하기 위한 안입부, 방향홈부, 보스 및 나사 부분과 같은 수단이 형성된다. 이는 기계(201)의 전체 비용과 중량을 감소시킨다. 하우징(210)의 기부(215)에는 바람직하게는 안정적인 방식으로 그 상에 기계를 직립시키기 위한 피트(feet)가 제공된다. 대안적으로, 기부(215) 자체가 안정적인 지지부를 형성하는 형상을 가질 수도 있다.

[0151] 하우징(210)의 전방 절반부(211)는 음료의 분배가 발생되는 분배 스테이션(270)을 포함한다. 분배 스테이션(270)은 통적 받이(drip tray) 272)를 형성하는 중앙 내부를 갖는 리셉터클 스탠드(271)를 포함한다. 리셉터클 스탠드의 상부 표면(273)에는 리셉터클이 위치되는 그릴(grill; 274)이 제공된다. 통적 받이(272)는 수집된 물을 음료와 배우기 위하여 하우징(210)으로부터 제거될 수 있다. 리세스(275)는 소정 크기의 리셉터클을 수용하도록 리셉터클 스탠드(271) 위에서 하우징(210)의 전방 절반부 내에 형성된다. 카트리지 헤드(250)는 도35 및 도36에 도시된 바와 같이 리셉터클 스탠드 위에서 하우징(210)의 상부에 상에 위치된다. 바람직하게는, 카트리지 헤드(250)에 대한 그릴(274)의 높이는 상이한 크기의 리셉터클을 수용하도록 조절될 수 있다. 리셉터클은 분배되는 음료가 리셉터클과 접촉하기 전에 내려오는 높이를 최소화하도록 가능한 한 카트리지 헤드(250)에 가까우면서도 리셉터클의 분배 스테이션(270)으로 삽입되거나 그로부터 인출될 수 있어야 한다. 이는 음료의 분무와 튀김을 최소화하고, 존재하는 휘발된 기포의 손실을 최소화하도록 작용한다. 바람직하게는, 70 ㎜ 내지 110 ㎜의 높이를 갖는 리셉터클이 그릴(274)과 카트리지 헤드(250) 사이에 삽입될 수 있다.

[0153] 기계 사용자 인터페이스(240)는 하우징(210)의 전방부 상에 위치되고, 시작/정지 버튼(241)과 복수의 상태 표시기(243 내지 246)를 포함한다.

[0154] 상태 표시기(243 내지 246)는 바람직하게는 기계(201)의 준비 상태를 지시하는 발광 다이오드(LED; 243), 기계(201) 작동시 발생되는 오류의 여부를 지시하는 LED(244), 및 기계(201)가 수동 또는 자동 모드에서 작동하는지의 여부를 지시하는 하나 이상의 LED(245 내지 246)를 포함한다. LED(243 내지 246)는 기계(201)의 상태에 따라 일정한 강도로 조명되도록, 연속적으로 반적이도록, 또는 이를 모두를 제어할 수 있다. LED(243 내지 246)는 그린, 레드 및 블루우를 포함하는 다양한 색상을 가질 수 있다.

[0155] 시작/정지 버튼(241)은 분배 주기의 개시를 제어하고, 누를 버튼, 스위치 또는 유사한 것으로 수동으로 작동된다.

[0156] 부피 조절 제어부가 기계(201)의 사용자가 다른 작동 특성의 변경하지 않고 전달되는 음료의 부피를 수동으로 조절할 수 있도록 제공될 수 있다. 바람직하게는, 부피 조절 제어부는 부피를 ±20%로 조절할 수 있게 한다. 부피 조절 제어부는 회전 노브(rotary knob), 선형 슬라이더(linear slider), 증가 및 감소 버튼을 갖는 디지털 판독부, 또는 유사한 것일 수 있다. 더욱 전형적으로는, 부피는 사용자가 시작/정지 버튼(241)을 작동시킴으로써 제어된다.

[0157] 수동 전원 스위치(도시 안됨)가 기계(201) 상에 제공될 수 있다. 대안적으로, 전원 공급은 주 전원 공급부로부터 전원 공급 플러그를 삽입 또는 제거함으로써 간단히 제어될 수 있다.

[0158] 물 탱크(220)는 하우징(210)의 후방에 위치된다. 하우징(210)의 후방 절반부(212)에 연결된다. 물 탱크(220)는 일반적으로 미적인 이유로 필요에 따라 명확한 또는 불투명할 수 있는 플라스틱 재료(221)를 포함한다. 탱크는 수동으로 제거될 수 있는 뚜껑(222)에 의해 사용시 폐쇄되는, 탱크를 물로 채우기 위한 입구를 포함한다. 출구는 탱크의 하부 단부를 향해 제공되어, 물 펌프(230)와 연통한다. 물 탱크(220)는 소비자가 탱크 내에 남아 있는 물의 양을 볼 수 있도록 투명 또는 반투명 재료로부터 제조될 수 있다. 대안적으로, 물 탱크(220)는 불투명 재료로부터 제조되지만 내부의 잔물 물의 볼륨을 수 있다. 부가적으로 또는 대안적으로, 물 탱크(220)에는 탱크 내의 수위가 미리 선택된 수준까지 감소된 때 물 펌프(230)의 작동을 방지하고 전력적으로 LED와 같은 경고 표시기를 작동시키는 저 수위 센서가 제공될 수 있다. 물 탱크(220)는 바람직하게는 대략 1.5 리터의 내부 용량을 갖는다.

[0159] 물 펌프(230)는 도43에 개략적으로 도시된 바와 같이 물 탱크(220)와 물 히터(225) 사이에 작동식으로 연결된다. 제어 프로세서에 의해 제어된다. 펌프는 2.5 bar의 최대 압력에서 900 ml/분의 물의 최대 유동률을 제공한다. 바람직하게는, 정상 사용시, 압력은 2 bar로 제한될 것이다. 기계(201)를 통한 물의 유동률은 펌프에 대한 전기 공급을 초퍼(chopping)하는 사이클에 의해 펌프의 소정 비율의 최대 유동률로 제어 프로세서에 의해 제어될 수 있다. 바람직하게는, 펌프는 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%

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또는 1000의 회전 비율의 유동률 중 임의의 유동률에서 구동될 수 있다. 펌핑된 물의 부피의 정확도는 바람직하게는 + 또는 - 5%이다. 이로써 분배되는 음료의 최종 부피는 + 또는 - 5%의 정확도를 갖게 된다. 적합한 펌프는 Ulka S.r.l.(이탈리아, 파비아 소재)에 의해 생산되는 Ewich(on EP5 펌프이다. 부피측정 유동 센서(도시 안됨)가 물 펌프(230)의 상류 또는 하류의 유동 라인에 제공되는 것이 바람직하다. 바람직하게는, 부피측정 유동 센서는 터빈 센서이다.

[0160] 물 히터(225)는 하우징(210)의 내부에 위치된다. 히터(225)는 1550 W의 출력을 갖고, 물 펌프(230)로부터 수용한 물을 1분 안에 대략 20℃의 시작 온도로부터 약 95℃의 작동 온도까지 가열할 수 있다. 바람직하게는, 분배 주기의 종료와 히터(225)가 후속 분배 주기를 시작할 수 있는 사점 사이의 지연 시간은 10초 미만이다. 히터는 선택된 온도를 분배 주기 동안 + 또는 - 2℃ 내로 유지한다. 후술되는 바와 같이, 분배 주기를 위한 물은 82℃ 내지 93℃에서 카트리지 헤드(250)로 전달될 수 있다. 히터(225)는 85℃의 물을 온도로부터 85℃ 또는 95℃ 까지로 전달 온도를 신속하게 조절할 수 있다. 히터(225)는 온도가 96℃ 초과한다면 히터를 정지시키는 과열 차단장치(over-temperature cut-off)를 포함한다. 히터(225)로부터 출력되는 물은 경량형 튜브에 의해 카트리지 헤드(250)의 카트리지(1)로 이송된다. 유동하는 물의 압력은 수동형 수 있다면, 물은 카트리지(1)를 통과한다. 압력이 미리 설정된 제한값보다 낮거나 높다면, 물의 경량형 튜브에 의해 동력 분이 회수 리셉터클(270) 내로 전환된다.

[0161] 공기 압축기(235)는 일방향 튜브에 의해 카트리지 헤드(250)에 작동적으로 연결되고, 제어 프로세서에 의해 제어된다. 공기 압축기(235)는 1.0 bar에서 500 ml/분의 최대 유동률을 제공한다. 사용시, 35 ml의 작동 부피가 2.0 bar로 가압된다. 바람직하게는, 공기 압축기(235)는 2가지의 유동률, 즉 고속(최대) 유동률 및 저속 유동률을 생성할 수 있다.

[0162] 음료 조제 기계(201)의 제어 프로세서는 프로세싱 모듈과 메모리를 포함한다. 제어 프로세서는 물 히터(225), 물 펌프(230), 공기 압축기(235) 및 사용자 인터페이스(240)에 작동식으로 연결되어 이들의 작동을 제어한다.

[0163] 제어 프로세서의 메모리는 음료 조제 기계(201)를 위한 하나 이상의 작동 매개변수에 대한 하나 이상의 변수를 포함한다. 예시된 실시예에서, 작동 매개변수는 작동 단계 중에 음료 카트리지(1)를 통과하는 물의 부피, 음료 카트리지(1)의 충전 속도, 침액(soak) 단계의 존재 여부, 음료의 총 분배 부피, 펄싱 단계 중의 물의 유동률, 및 침화 단계의 유동률 및 기간이다.

[0164] 작동 매개변수에 대한 변수들은 메모리 내에 저장된다. 카트리지(1)는 카트리지(1) 내에서의 음료의 최적 분배를 위해 요구되는 작동 매개변수를 나타내는 코드를 카트리지(1) 상에 또는 그 내부에 포함한다. 코드는 바이너리(binary) 형식이고, 제어 프로세서 메모리 내에 저장된 변수에 대응하는 복수의 데이터 비트(bit)를 포함한다. 표 3은 13 비트의 데이터가 전술한 바와 같은 작동 매개변수에 대한 필요한 변수를 나타내도록 사용될 수 있는 방법을 예시한다.

[0165] [표 3]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[0166]

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		[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[0167]

[0168] 카트리지(1) 상의 또는 그 내부의 코드는 통상 오류 확인을 위한 하나 이상의 여분의 데이터 비트를 포함할 것이다. 실 예에서, 16 비트 코드가 제공된다. 이를 돕면, 표 3에 열거한 변수를 사용함으로써, 코드 "1000100011110"를 담고 있는 카트리지(1)는 하기의 작동 변수를 가질 것이다.

[0169] 10 83℃의 물 온도

[0170] 00 송액에 의한 고속 송출

[0171] 1000 150 ml의 분배되는 음료 부피

[0172] 111 유동률은 100%

[0173] 10 고속 증기 유동 정화/단기간

[0174] 그러므로, 여러의 음료 조제 기계와 같은, 제어 프로세서의 메모리는 카트리지 유형에 기초한 음료 카트리지에 대한 작동 명령, 즉 커피 카트리지에 대한 명령, 초콜릿 카트리지에 대한 명령 등을 저장하지 않는다. 대신에, 제어 프로세서의 메모리는 분배 주기의 개별 작동 매개변수를 조절하는 변수들을 저장한다. 이는 많은 장점을 갖는다. 첫 번째로, 분배 주기에 대한 더 높은 정도의 제어가 실행될 수 있다. 예를 들면, 모든 커피 유형에 대해 동일한 매개변수를 사용하기보다는 약간 상이한 작동 매개변수들이 스마일 등급 또는 블렌드의 커피에 대해 사용될 수 있다. 게다가 매개변수보다는 카트리지 유형에 의한 명령을 제공하는 종래의 포맷 해석법은, 이들의 고유 복잡한 제어 프로세서 내의 매우 가능한 저장 공간을 빠르게 소모하기 때문에 유사한 음료 유형에 대한 분배 주기에서의 미묘한 차이에 대해서는 적절하지 않다. 두 번째로, 본 발명의 포맷 방법은 새로운 음료 카트리지 유형을, 새로운 음료 카트리지(1)를 위한 분배 주기에 대한 작동 매개변수가 음료 조제 기계(201)가 판매된 이후에 결정되는 경우에도 기존의 음료 조제 기계에 사용될 수 있게 한다. 마는, 음료 조제 기계(201)의 제어 프로세서가 음료가 새로운 유형임을 인식할 필요가 없기 때문이다. 오히려, 분배 주기의 작동 매개변수는 음료 유형을 지정할 필요가지 않고 설정된다. 그러므로, 본 발명의 포맷 방법은 새로운 음료 유형에 대한 음료 조제 기계의 우수한 사용 호환성을 제공한다. 반대로, 제조의 기계의 경우, 제조자는 새로운 음료 유형의 분배를 제한하여, 메뉴되는 기계들에 의해 결정된 기존의 분배 주기들 중 하나를 사용한다.

[0175] 카트리지 헤드(250)는 도3B 내지 도4C에 도시되어 있다. 카트리지 헤드(250)의 카트리지 홀더(251)는 고정된 하부 부분(255), 회전 가능한 상부 부분(256) 및 고정된 하부 부분(255)과 회전 가능한 상부 부분(256) 사이에 위치한 피봇 가능한 카트리지 장착부(257)를 포함한다. 상부 부분(256), 하부 부분(255) 및 카트리지 장착부(257)는 공통 원지 축(258)을 중심으로 회전한다. 도3B 내지 도4C는 명확함을 위하여 기계(201)의 일부 구성 요소가 생략된 상태로 카트리지 홀더(251)를 도시한다.

[0176] 회전 가능한 상부 부분(256)과 피봇 가능한 카트리지 장착부(257)는 플랜징 기구(280)에 의해 고정된 하부 부분(255)에 대해 이동한다. 플랜징 기구(280)는 제1 및 제2 복제 또는 부분(281, 282)을 갖는 플랜징 레버를 포함한다. 플랜징 레버의 제1 부분(281)은 카트리지 홀더(251)의 각각의 측면 상의 2개의 제1 피봇 지점(283)에서 상부 부분(256)에 피봇 가능하게 장착된 U자형 아암을 포함한다.

[0177] 플랜징 레버의 제2 부분은 원지 축(258) 상에 위치된 제2 피봇 지점(285)에서 상부 부분(256)에 각각 피봇 가능하게 장착된 카트리지의 각각의 측면 상의 2개의 편심(over-centre) 아암(282)을 포함한다. 선택 부분(256)을 고정된 하부 부분(255)에 결합한다. 각각의 편심 아암(282)은 실린더(282a), 스템(282b), 및 단부 실리브(282c)를 포함하는 형목 부재이다. 실린더(282a)는 내부 보어를 갖고, 원지 축(258)의 일 단부에 회전 가능하게 장착된다. 스템(282b)의 제1 단부는 실린더(282a)의 보어 내에 활주 가능하게 수용된다. 스템(282b)의 반대편 단부는 제3 피봇 지점(286)에서 U자형 아암(281)에 회전 가능하게 장착된다. 제3 피봇 지점(286)은 상부 부분(256)과 하부 부분(255)에 연결되지 않고 이들에 대해 자유롭게 이동할 수 있다. 탄성 슬리브(282c)는 스템(282b) 상에서 피부에 장착되고, 사용시 실린더(282a)와 스템(282b) 상의 맞닿는 표면들 사이로 연장된다. 탄성 슬리브(282c)는 편심 아암(282)의 단축을 조절하지만, 편심 아암(282)을 연장된 형상으로 편향시킨다. 그러므로, 원지 축(258)을 향한 그리고 이로부터 멀어지는 제3 피봇 지점(286)의 이동은 실린더(282a) 내의 스템(282b)의 상대적인 이동에 의해 가능하게된다. 탄성 슬리브(282c)는 바람직하게는 실리콘으로부터 형성된다.

[0178] U자형 아암(281)은 카트리지 홀더(251)의 전방 플랜지로 연장하고, 각각 원지 축(258)을 수용한 형 표면(288)

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을 포함한다. 카트리지 홀더(251)의 각각의 측면 상의2개의 하방으로 연수되는 훅크 부재(287)를 포함한다. 카트리지 홀더(251)의 고정된 하부 부분(255)에는 대체로 훅크 부재(287)와 정렬된 전방 에지(260)에서 또는 그 부근에서 하부 부분(255)의 각각의 측면 상에 위치된 2개의 보스(259) 또는 연결부가 제공된다.

[0178] 도3에 도시된 바와 같이, U자형 아암(281)은 아암과 일체형의 인간 환경 공학적인 핸드 그립과 훅크 부재(287)를 포함하는 일체 플라스틱 성형품으로부터 형성된다.

[0180] 카트리지 장착부(257)는 카트리지 홀더(251)의 상부 및 하부 부분(255, 256) 사이에 회전 가능하게 장착된다. 장착부(257)에는 사용시 음료 카트리지(1)를 수용하는 사실상 원형의 리세스(290)가 제공된다. 리세스(290)는 음료 카트리지(1)의 전방 부분(24)을 수용하고 또한 카트리지 홀더(251) 내의 음료 카트리지(1)의 회전을 방지하도록 작용하는 불규칙한 부분(Irregularity: 291)을 포함한다. 카트리지 장착부(257)는, 도4에 도시된 바와 같은 개방 위치에서 카트리지 장착부(257)가 고정 하부 부분(255)과의 접촉으로부터 멀어지며 카트리지 장착부(257)가 출구 및 입구 천공 부재(264, 263)와의 접촉으로부터 이동되도록, 고정된 하부 부분(255)에 대해 움직인다 있다. 카트리지 장착부(257)에는, 카트리지 장착부(257)가 폐쇄 위치로 이동될 때 입구 및 출구 천공부(263, 264)와 카트리지 인식 수단(252)의 헤드(300)를 수용하기 위한 개구(292)가 제공된다.

[0181] 상부 부분(255)은 소비자가 본원 주기 동안 음료 카트리지(1)를 볼 수 있고 또한 카트리지(1)가 기계(201) 내에 장착되었는지의 여부를 확인할 수 있는 대체로 원형인 본체(310) 하우징 내의 원형 창살 창(312)을 포함한다. 창살 창(312)은 카트리지 홀더(251)가 폐쇄되었을 때 하부 부분(255)에 대향하며 음료 카트리지(1)의 플랜지(36)와 결합하고 따지하는 하방 링(311)을 갖는 컵 형상이다. 동시에, 창(312)은 카트리지(1)의 폐쇄 상단부(11)와 접촉한다. 창살 창(312)의 원형 본체(310)에 실질적으로 축방향으로 조밀한 이동하도록, 파형(wave) 스프링(도시 안됨)은 창살 창(312)과 원형 본체(310) 사이에 위치한다. 플랜지(36) 상의 링(311) 및 폐쇄 상단부(11) 상의 링(312)에 의해 인가된 압력은 카트리지(1)와 카트리지 홀더(251) 사이의 유체 기밀 밀봉을 보장한다.

[0182] 하부 부분(255)은 입구 및 출구 천공부(263, 264)와 카트리지 인식 수단(252)의 헤드(300)를 포함한다. 입구 천공부(263)는 사용시 음료 카트리지(1)의 라미네이트(5)를 천공시키기 위한 날카로운 단부(261)를 갖는 중공 바늘형 튜브(260)를 포함한다. 입구 천공부(263)는 하부 부분(255)을 통과하는, 도4에 도시된 바와 같은 튜브(262)과 유체 연통하고, 물 히터(225)의 출구 도관(263)에 연결된다. 출구 천공부(264)는 EP 0 889 801호 및 EP 0 334 572호에 설명된 출구 천공부와 유사한 구성이며, 폐출구(43)보다 큰 직수를 갖는 원형 또는 다각형 단면을 갖는 개방 단부형 실린더(264)를 포함한다. 출구 천공부(254)의 상부 단부의 이차원 부분(265)은 음료 카트리지(1)의 라미네이트를 천공시키고 절곡부를 형성하기 위하여 톱니 모양으로 되어 있다. 상부 단부의 나머지 부분은 원형의 라미네이트(5)를 천공하기 전에 출구 개구를 통해 열리 않게나 닫기게 하기에 적어도 톱니 모양 부분의 치(266)의 기부에서 실질적으로 동일한 직경으로 축방으로 연장된다. 출구 천공부(254)는 라미네이트(5)를 폐출구(43)의 외부로 천공시키고, 카트리지 장착부(257)가 폐쇄 위치에 있을 때에 돔형 컬렉기(40)의 폐출구(43)와 외부 에(42) 사이에 천공으로 놓인다. 출구 천공부(254)는 라미네이트(105)를 천공으로 절도다. 이와으로써, 출구 천공부(254)와 절단된 라미네이트(105)는 폐출되는 음료의 경로로부터 유지된다.

[0183] 출구 천공부(254)는 그의 주변에 배치 0.5 ㎜ 상승된 리지(ridge: 254a)에 의해 둘러싸인다.

[0184] 유리한게도, 출구 천공부(254)는, 예컨대 압시 세척기 내에서 철저하게 세척될 수 있도록 하부 부분(255)으로부터 제거될 수 있다. 제거 가능한 출구 천공부(254)는 끼지되는 하부 부분(255) 내의 리세스(267)에 수용된다. 입구 천공부(263) 및/또는 출구 천공부(264)는 스테인레스강과 같은 금속, 또는 플라스틱 재료로부터 제조될 수 있다. 유리하게는, 플라스틱 절단 요소의 사용은 비금속 재료에 의해 구멍을 형성하거나 절단할 수 있는 라미네이트의 사용에 의해 가능해진다. 결과적으로, 천공부(263, 264)는 소비자에게 부상을 입힐 위험을 덜추기 위하여 보다 덜 날카롭게 제조될 수 있다. 또한, 플라스틱 천공 요소는 부식되지 않는다. 입구 천공부(263)와 출구 천공부(24)는 하부 부분(255)으로부터 제거될 수 있는 단일 일체형 유닛으로서 형성된다.

[0185] 사용시, 카트리지 홀더(251)의 상부 부분(256)은 도3에 도시된 바와 같이 수직으로 또는 수직을 향해 뒤당는 개방 위치로부터 사실상 수평하게 고정된 하부 부재(255)와 카트리지 장착부(257)와 상호 결합되도록 폐쇄된 폐쇄 위치까지 이동될 수 있다. 상부 부분(256)은 폐쇄된 컨버의 작동에 의해 개방 위치로부터 폐쇄 위치까지 이동된다. 상부 부재(256)를 폐쇄시키기 위하여, 사용자는 U자형 아암(281)에 의해 폐쇄된 레버를 보유하고 이를 하향으로 당긴다. 결과적으로, 상부 부분(256)은 먼저 창살 창(312)의 링(311)을 카트리지 장착부(257) 내의 음료 카트리지(1)의 플랜지(36)와 접촉하게 하고 및/또는 창(312) 자체를 카트리지(1)의 폐쇄 상단부(11)와 접촉하게 하도록 회전한다. 상부 부분(256)의 계속되는 회전에 의해 상부 부분(256)과 카트리지 장착부(257)는 하부 부분(255)과 접촉 상태로 하방으로 회전된다. U자형 아암(281)의 추가의 회전에 의해, U자형 아암(281)은 상부 부분(256)과 하부 부분(255)에 대해 회전되며, 상부 부분(256)의 훅크 부재(287)가 정 표면(288)을 보스(259) 위에 놓이게 한 상태에서 하부 부분(255)의 보스(259)와 결합하게 된다. 회전의 마지막 단계 동안, 카트리지(1)는 카트리지 장착부(257)와 창살 창(312) 사이에서 압축된다. 결과적으로, 창살 창(312)은 파형 스프링의 편향에 대항하여 상부 부분(256)의 원형 본체(310)에 대해 축방향으로 이동된다. 이러한 이동에 의해 음료 카트리지(1)와 음료 조제 기계 내의 공기가 폭로되게 되고, 카트리지에 외기압 압축력의 양이 수용 가능한 범위 내에서 유지되는 것을 보장한다. 파형 스프링 또는 다른형 스프링의 작동에 의해 편향되는 기구의 폐쇄력은 카트리지 상에 130 내지 200N의 폐쇄력 압력을 보장한다. 바람직하게는, 힘은 대략 200 N이다. 약 130 N 미만의 힘은 적당한 밀봉을 제공하지 않는 반면, 약 200 N을 초과하는 힘은 카트리지(1)의 구성 요소의 소성 파손을 초래한다. 카트리지 헤드의 폐쇄 동안, 카트리지(1)의 라미네이트(5)는 출구 천공부(254)를 둘러싸는 리지(254a)와 압축하게 됨에 따라 인장된다. 천공된 라미네이트(5)를 통과하는 외부 튜브(42)의 팽단부가 플랜지(36)에 대해 0.5 ㎜만큼 상방으로 이동함에 따라 라미네이트(5)를 평면으로부터 돌출되게 한다. 이러한 이동은 또한 카트리지에 인가된 압축력의 대부분에 하중 지지 내부 부재(3)를 통해 카트리지(1)의 중앙 영역을 통해 작용하는 것을 보장한다. 그러므로, 폐쇄 위치에서, 카트리지(1)는 창살 창(312)의 링(311)에 의해 플랜지(36) 둘레로 폐

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형할 수 있고, 관찰 창(312)과 리지(254a)와의 접촉에 의해 내부 부재(3)의 외부 튜브(42)와 카트리지의 베이스 상단부(11) 사이에서 항상 견고하게 볼텍팅된다. 이러한 볼텍팅력은 가압 중의 카트리지(1)의 회전을 방지하는 것을 돕고, 또한 내부 부재(3)와 외부 부재(2)가 서로에 대해 원만하게 베어링하는 것과 이때 따른 모든 내부 튜브와 캐구가 내부 가압 중에도 이들의 의도된 치수로 유지되는 것을 보장한다.

[0186] 가상의 기준선이 카트리지 홀더(251)의 제1 및 제2 피봇 지점(283, 285) 사이에 그려질 수 있다. 도4에서 볼 수 있는 바와 같이, 제1 위치에서, 제2 피봇 지점(285)은 고정된 하부 부분(255)에 가장 근접한 기준선 측에 위치된다. 상부 부분(256)이 회동 위치에 도달함에 따라, 볼텍팅 레버의 제3 피봇 지점(286)은 제1 및 제2 피봇 지점(283, 285)과 멀어지는 기준선을 통해 고정된 하부 부분(255)으로부터 가장 먼 측의 반대측까지 통과한다. 결과적으로, 내부 아암(281)은 안정된 제1 위치로부터 안정된 제2 위치까지 "스냅작용"으로 통과된다. 스냅 통과 작용은 편심 아암(282)의 단속과 후속하는 탄성 슬리브(282c)의 압축에 의해 제공된다. 제3 피봇 지점(286)이 가상 기준선을 통과하면, 탄성 슬리브(282c)의 회복은 제3 피봇 지점(286)의 이동이 가상 기준선으로부터 멀리 계속되도록 작용한다. 그러므로, 볼텍팅 레버는, 레버가 제1 위치에서 안정되지만 제3 피봇 지점(286)이 제1 및 제2 피봇 지점(283, 285)의 반대편 가상 기준선을 통과하는 제2 위치에서 안정되는 "스냅작용" 형태의 작동을 갖는다. 그러므로, 볼텍팅 레버의 회동의 스냅 통과 작용은, 볼텍팅 레버의 회전의 최종 단계에서 내부 아암(281)과 제2 아암(284)의 소정 각도의 이동이 후크 부재(267)를 보스(269)와의 견고한 결합 상태로 가압하게 되는 놀랍한 볼텍팅 작용으로 이어지는 놀랄 볼텍 기구를 제공한다. 또한, 탄성 슬리브(282c)는, 제3 피봇 지점(286)을 제1 및 제2 피봇 지점(283, 285)의 반대편 가상 기준선을 다시 통과하도록 슬리브(282c)를 후퇴하게 이동시키기 위하여 압축하는 데에 최소의 힘이 요구되기 때문에, 상부 부분(256)의 재개방에 대한 저항성을 제공한다. 유리하게도, 후크 부재(267)와 보스(269)의 상호 볼텍팅 레버의 회전 이외의 수단에 의한 후크 부재(267)와 보스(269)의 분리를 방지한다. 이는 카트리지 헤드(250)가 내부 가압을 받을 때의 작동 중에 카트리지 헤드(250)가 개방되는 것을 방지하는 데에 유용하다.

[0187] 카트리지 인식 수단(252)의 목적은 기계(201)가 삽입된 음료 카트리지(1)의 유형을 인식하게 이에 따른 하나 이상의 작동 매개변수를 조절할 수 있게 하는 것이다. 전형적인 실시예에서, 카트리지 인식 수단(252)은 도4에 도시된 바와 같은 음료 카트리지(1)의 라미네이트(5) 상에 제공된 인쇄된 바코드(320)를 판독하는 광학 바코드 판독기를 포함한다. 바코드(320)는 대비되는 색상의 복수의 바코드로부터 형성된다. 바람직하게는, 바(bar)는 대비를 최대화하도록 흑색 혹은 흑색의 톤이다. 바코드(320)는 공개된 표준에 따를 필요는 없지만, EAN-13, UPC-A 또는 Interleaved 2 of 5와 같은 바코드를 표준 형식이 사용될 수 있다. 광학 바코드 판독기는 바코드(320)를 조명하기 위한 하나 이상의 LED(321), 바코드의 화상을 획득하기 위한 초점 렌즈(322), 획득된 화상을 나타내는 전기 신호를 생성하기 위한 근하 결합 소자(CCD)(323), 및 LED와 CCD를 위한 지원 회로를 포함한다. 바코드 판독기를 수동하기 위한 하부 부분 내의 공간은 제한된다. 거울 또는 거울들(324)이 LED(321)로부터 하부 부분(255) 내에 위치하지 않는 초점 렌즈로 광을 반사시키기 위하여 사용될 수 있다. 개략적인 배열이 도4a 및 도4b에 도시되어 있다. 하부 부분(255)은 음료 카트리지(1) 상의 바코드(320)와 볼텍한 크기를 갖는 개구(326)를 포함한다. 사용시, 생성된 전기 신호는 신호 프로세싱 소프트웨어에 의해 디코딩되고, 결과가 제어 프로세서로 전달된다. 소프트웨어는 바코드의 판독에 오류가 포함되었는지의 여부를 인식할 수 있다. 바코드(320)는 오류 메시지가 소비자에게 제공되기 전에 여러 번 재스캔될 수 있다. 기계(201)가 바코드를 판독할 수 없는 경우, 소비자는 수동 작동 모드를 사용하여 음료 카트리지(1)가 음료를 분배하도록 사용할 수 있다.

[0188] 카트리지 헤드(250)는 또한 카트리지 홀더(251) 내에 카트리지가 존재하는지의 여부를 검출하는 카트리지 센서를 포함한다.

[0189] 카트리지 헤드(250)는 또한 카트리지 홀더(251)가 적절하게 폐쇄되었는지의 여부를 검출하는 검출 센서를 포함한다. 바람직하게는, 검출 센서는 카트리지 홀더(251)가 폐쇄 및 잠금되었을 때 작동되는 마이크로스위치를 포함한다. 바람직하게는, 카트리지 센서와 검출 센서는 두 센서의 출력이 안속스럽도록, 즉 분배 주기가 시작되기 전에 카트리지가 존재하고 가구가 잠금되도록 작동로 연결된다.

[0190] 기계(201)의 작동은 음료 카트리지(10)의 카트리지 헤드(250) 내부로의 삽입을 포함하며, 음료가 분배되고 카트리지(10)가 기계로부터 제거되는 분배 주기를 수반한다.

[0191] 기계(201)의 사용 중의 가동은 제어 프로세서에 내장된 소프트웨어에 의해 결정된다. 기계의 작동은 "상태"(State)와 관련하여 설명할 수 있으며, 기계(20)는 상태 변화로 불리는 단계인 상태를 변경하는 사고가 발생하지 않는 한 항상 특정한 상태로 존재할 것이다.

[0192] 표 4는 음료 조제 기계(201)의 일 실시예에 대한 상태 및 상태 변화를 예시하는 상태 변화 표를 도시한다.

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[0193] [표 4]

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[0194]

7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12	[illegible]				[illegible]		

[0195]

[0196] 하기의 예는 제어 프로세서에 의한 상태 변화의 사용을 예시하는 본 발명 추가를 설명한다.

[0197] 커피(201)는 초기에 꺼져 있고 카트리지 헤드(250) 내에 삽입된 카트리지(1)가 없는 것으로 가정한다. 커피(201)가 켜졌을 때, 제어 프로세서는 상태 1에 있다. 물 히터(225)가 켜진다. 온도가 85°C에 도달하면, 제어 프로세서는 상태 2로 변화한다. 상태 1 및 2 동안의 임의의 시간에서, 카트리지 홀더(251)가 폐쇄된다면, 감응 센서는 카트리지 홀더(251)가 적절하게 폐쇄되었음을 지시하는 신호를 제어 프

로세서로 송신하도록 작동될 것이다. 그 후, 제어 프로세서는 'readrod' 명령을 송신함으로써 카트리지 센서에 신호를 보낸다. 카트리지 센서는 카트리지가 카트리지 홀더(251) 내에 제 위치에 있는지의 여부를 지시하는 신호를 제어 프로세서로 다시 송신한다. 카트리지가 없다면, 제어 프로세서는, 제어 프로세서가 상태 2로 다시 변환하는 시점에서 카트리지 홀더(251)가 재개방될 때까지 준비 상태로 남아 있는 상태 3으로 변화한다. 카트리지가 존재한다면, 상태 2에서, 제어 프로세서는 상태 4로 변화하고, 작동은 자동적으로 계속된다. 상태 4 내지 9 중에, 물 온도는 음료 카트리지(1) 상의 바코드에 의해 설정된 작동 파라메터에 의해 설정되는 요구되는 온도의 요구되는 공차 범위 내에서 유지되도록 백그라운드에서 제어된다. 본체의 예열 단계가 완료되면, 공기 정화가 상태 8에서 개시된다. 공기 정화가 완료되면, 작동 주기가 완료되고 기계는 상태 10에서 대기 모드로 전입한다. 작동 중에, 오류가 발생하면, 프로세서는 상태 11로 변화한다. 저 수위가 검출되면, 프로세서는 상태 12로 변화한다.

[0198] 카트리지(1)를 삽입하기 위하여, 카트리지 홀더(251)는 카트리지 장착부(257)를 노출시키기 위하여 간출된 바와 같이 개방된다. 그 후, 카트리지(1)는, 카트리지의 챔버(24)이 불규칙한 부분(291) 내에 위치되도록 리세스(290) 내에 수용된 카트리지 장착부(257) 상에 배치된다. 카트리지(1)의 챔버 또는 자기 바코드(320)는 카트리지 장착부(257) 내의 개구(326) 바로 위로 배향된다. 그 후, 카트리지 홀더(251)는 간출된 바와 같이 폐쇄될 때까지 작동에 의해 폐쇄된다. 폐쇄 중에, 입구 및 출구 천공부(253, 254)는 카트리지 입구(121) 및 출구(122)를 형성하도록 카트리지(1)의 라미네이트(5)를 천공시킨다. 천공부(253, 254)가 작동시에 장착으로 간섭하고 천공부에 상대적으로 이동하는 것은 카트리지(1)라는 것을 알아야 한다. 간출된 바와 같이, 출구 천공부(254)에 의해 절단된 라미네이트(5)는 배출구(43)를 폐쇄하는 차단으로 접힌다. 폐쇄될 때, 카트리지 홀더(251)는, 불화 주기 동안 발생된 압력을 견디기에 충분한 힘으로 챔버 기밀 밀봉을 형성하도록 카트리지(1)를 카트리지 장착부(257)와 상부 부분(256) 사이 및/또는 링(311)과 카트리지(1)의 상단부(11) 사이에서 링(35) 둘레로 파지한다.

[0199] 작동 주기를 개시하기 위하여, 소비자는 시작/정지 버튼(241)을 작동시킨다.

[0200] 작동 주기는 카트리지 인식 단계 및 불화 주기를 포함한다.

[0201] 카트리지 인식은, 카트리지 센서와 잠금 센서로부터의 입력이 만족스럽다고 가정하면, 간출한 바와 같이 장착 카트리지 인식 수단(252)에 의해 수행된다. 바코드(320)가 디코딩되면, 기계(201)의 작동 파라메터는 제어 프로세서에 의해 조절된다. 그 후, 불화 주기가 자동적으로 개시된다.

[0202] 불화 주기는 모든 음료 유형에 대하여 전체가 사용되지는 않지만, 4개의 주요 단계를 갖는다.

[0203] (i) 예비 습윤(Pre-wet)

[0204] (ii) 중지(Pause)

[0205] (iii) 추출/혼합(Brew/Mixing)

[0206] (iv) 정화(Purge)

[0207] 예비 습윤 단계에서, 카트리지(1)는 물 펌프(230)에 의해 물 저장 탱크(220)로부터 물로 충전된다. 물에 의한 충전에 의해 여과 챔버(130) 내의 음료 성분(200)은 습윤된다. 충전은 600 ml/분의 "고속" 유동률 또는 200 ml/분의 "저속" 유동률에서 수행될 수 있다. 저속 충전률은 통상, 음료 성분이 보다 높은 체적 유동률에서 팽창하기 전에 소정의 침적을 필요로 하는 점성 액상 음료 성분을 함유하는 카트리지에 유용하다. 카트리지(1) 내로 분출되는 물의 부피는 물 또는 음료가 이러한 단계 중에 카트리지 출구(122)로부터 떨어지지 않는 것을 보장하도록 선택된다.

[0208] 중지 단계는 음료 성분(200)이 미리 설정된 기간 동안 예비 습윤 단계 중에 분출된 물에 의해 침적되는 것을 허용한다. 예비 습윤 및 침적 단계 모두는 음료 성분(200)으로부터 추출될 수 있는 산물량을 증가시키고 음료의 최종 향을 개선하는 것으로 알려져 있다. 예비 습윤 및 침적은 특히 음료 성분의 볶고 분쇄된 커피인 경우에 사용된다.

[0209] 추출/혼합 단계에서, 물은 음료 성분(200)으로부터 음료를 조제하도록 카트리지(1)를 통과한다. 물의 유동은 물 펌프(230)로부터 카트리지 헤드(250)로 통과하는 물을 가열하도록 물 히터(225)에 명령을 송신하는 제어 프로세서에 의해 결정된다. 물은 도관(262)을 통해 입구 챔버의 입구 천공부(253)를 거쳐 음료 카트리지(1)의 입구 챔버(126) 내부로 카트리지 홀더(251)의 하부 부분(255)으로 전달된다. 추출 및/또는 혼합과 후속하는 음료 카트리지(1)로부터의 음료의 분배는 음료 카트리지(1)의 형태와 전략하여 전술된 바와 같다.

[0210] 공기 정화는 모든 음료가 분배되고 유동 경로가 다른 음료의 분배를 위하여 준비되도록 세척되었음을 보장하도록 음료 조제 기계와 음료 카트리지(1)를 통해 가압 공기를 송풍하는 단계를 포함한다. 공기 정화는 대부분의 유체가 유동 경로에서 세척되는 것을 허용하도록 추출/혼합 단계의 종지시 바로 개시되지 않는다. 이는 공기 정화의 개시에 의해 내부 압력의 수용할 수 없는 급격한 상승을 방지한다.

[0211] 정상 작동에서, 사용자는 시작/정지 버튼(241)을 작동시킴으로써 기계(201)를 수동으로 정지시킨다.

[0212] 작동 주기가 진행되면, 소비자는 카트리지 홀더(251)를 개방하고 카트리지를 수동으로 제거 및 폐기함으로써 카트리지(1)를 제거한다. 대안적으로, 기계(201)에는 카트리지 홀더(251)의 개방 시에 카트리지를 자동적으로 제거하기 위한 자동 방출 기구가 제공될 수 있다.

[0213] 기계(201)와 카트리지(1)를 사용하여 음료를 전달하는 시간은 전형적으로, 볶고 분쇄된 커피의 경우 10 내지 120초, 바람직하게는 30 내지 40초, 초콜릿의 경우 5 내지 120초, 바람직하게는 10 내지 20초, 그리고 우유의 경우 5 내지 120초, 바람직하게는 10 내지 20초이다.

[0214] 기계(201)는 또한 유리하게는, 사용자에 의해 분배되는 음료의 유형에 대한 정보를 저장하고 제어 프로세서와 작동적으로 통신하는 메모리를 포함한다. 그 후, 기계(201)의 작동 주기는 다음 카트리지(1)를 위하여 조절될 수 있다. 이는 특히 2가지 이상의 음료 카트리지(1)가 음료를 조제하도록 연속적으로 사용되는 경우 유리하다. 예를 들면, 커피 카트리지는 카푸치노 음료를 조제하도록 우유 카트리지가 후속될 수 있

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다. 대안적으로, 소불린 카트리지는 크림 한 소불린 음료를 조제하도록 우유 카트리지가 옥속되어 사용될 수 있다. 본 메모리는 제1 음료에 대한 정보를 저장하는 메모리를 사용함으로써, 제2 카트리지, 즉 우유 카트리지를 분배하는 방식은 최적 음료를 달성하도록 변경될 수 있다. 전술한 예에서, 핫 소불린을 위해 분배되는 우유는 전형적으로 커피에 첨가되는 우유보다 잎 적을 수도 있다. 또한, 소불린을 위해 분배되는 우유는 음료의 거품생성의 정도를 감소시키도록 보다 저속의 유동률로 분배될 수도 있다. 다양한 조합의 카트리지가 가능하며, 각종 메커니즘는 당업자에에 명백할 것이다. 또한, 사용자가 다음으로 분배하길 원하는 음료의 유형을 키패(201)가 "예측"할 수 있게 하는 메모리가 사용될 수도 있다. 예를 들면, 사용자가 주로 8시의 음료 유형을 마신다면, 키패는 몇 시간이 이러한 음료 유형을 위한 최적 온도를 유지할 것을 지시할 수 있다.

청구항 요약

청구항 1

잎 이상의 음료 성분(200)을 포함하고 사실상 공기 및 물이 침투할 수 없는 재료로 형성되는 카트리지(1)에며, 상기 카트리지는 잎 이상의 음료 성분을 포함하는 저장 챔버(130; 134)와 메니폴드 챔버(16)를 한정하고, 메니폴드 챔버를 닫는 제1 부분과 저장 챔버를 닫는 제2 부분을 가지는 뚜껑(5)에 의해 폐쇄될 수 있는 개구(12)를 포함하며, 상기 개구를 통해 잎 이상의 음료 성분이 저장 챔버로 충전될 수 있고, 상기 뚜껑의 제1 부분은 사용시에 수성 매체의 메니폴드 챔버로의 유입을 수용하도록 관통 가능하고, 뚜껑은 사용시에 저장 챔버 내의 잎 이상의 음료 성분과 수성 매체의 상호 작용으로부터 형성된 음료의 유출을 수용하도록 천공 가능한 카트리지.

청구항 2

제1항에 있어서, 사용시에 저장 챔버 내의 잎 이상의 음료 성분과 수성 매체 간의 상호 작용으로부터 형성된 음료 유출을 수용하기 위해 천공 가능한 뚜껑(5)의 제3 부분에 의해 닫혀지는 배출 챔버를 더 포함하는 카트리지.

청구항 3

제2항에 있어서, 배출 챔버는 배출구(43)를 포함하는 카트리지.

청구항 4

제1항 내지 제3항 중 어느 한 항에 있어서, 메니폴드 챔버(16)와 저장 챔버(130; 134)는 잎 이상의 개구(17; 36)를 포함하는 구획부(27)에 의해 구분되는 카트리지.

청구항 5

제4항에 있어서, 개구(17; 36)는 잎 이상의 음료 성분이 저장 챔버(130; 134)로부터 메니폴드 챔버(16)로 통과하는 것을 방지하는 크기인 카트리지.

청구항 6

제1항 내지 제5항 중 어느 한 항에 있어서, 메니폴드 챔버(16)는 저장 챔버(130; 134)를 적어도 부분적으로 둘러싸는 카트리지.

청구항 7

제6항에 있어서, 메니폴드 챔버(16)는 저장 챔버(130; 134)를 사실상 완전히 둘러싸는 카트리지.

청구항 8

제4항에 있어서, 메니폴드 챔버(16)는 저장 챔버(130; 134)를 사실상 완전히 둘러싸고, 개구(17; 36)는 상기 메니폴드 챔버와 저장 챔버 사이의 사실상 모든 계면을 따라 제공되는 카트리지.

청구항 9

제4항 내지 제8항 중 어느 한 항에 있어서, 개구(17; 36)는 0.25 내지 0.35 ㎜의 폭을 가지는 카트리지.

청구항 10

제4항 내지 제9항 중 어느 한 항에 있어서, 개구(17; 36)는 1.4 내지 1.8 ㎜의 길이를 가지는 카트리지.

청구항 11

제4항 내지 제10항 중 어느 한 항에 있어서, 20 내지 40개의 개구(17; 36)가 제공되는 카트리지.

청구항 12

제1항 내지 제11항 중 어느 한 항에 있어서, 메니폴드 챔버(16)는 수성 매체가 도입되는 입구부(26)를 포함하고, 상기 입구부(26)는 잎 이상의 개구(30)를 통해 메니폴드 챔버(16)의 잔류물과 연통하는 카트리지.

청구항 13

제12항에 있어서, 입구부(26)는 정형인 카트리지.

청구항 14

제2항에 있어서, 저장 챔버(130; 134) 및 배출 챔버는 내부 부재(3)에 의해 분할되는 카트리지.

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청구항 15

제14항에 있어서, 내부 부재(3)는 둘 이상의 개구(55; 65)를 포함하는 카트리지.

청구항 16

제14항 또는 제15항에 있어서, 내부 부재(3)는 음료의 통과를 수용하는 둘만 및 이상의 음료 성분(200)이 저장 챔버(130; 134)로부터 배출 챔버로 들어가는 것을 방지하는 필터(4)를 포함하는 카트리지.

청구항 17

제14항 내지 제16항 중 어느 한 항에 있어서, 뚜껑(5)은 외부 부재(2) 및 내부 부재(3)와 결합되는 카트리지.

청구항 18

제17항에 있어서, 뚜껑(5)은 카트리지의 주연부 주위에서 외부 부재(2)와 결합하고 카트리지의 중심 또는 그 근처에서 내부 부재(3)와 결합하는 카트리지.

청구항 19

제18항에 있어서, 뚜껑(5)은 내부 부재의 배출 파이프(43)에 결합되는 카트리지.

청구항 20

제1항 내지 제19항 중 어느 한 항에 있어서, 외부 부재(2)는 뚜껑(5)보다 큰 견고성을 가지는 카트리지.

청구항 21

제1항 내지 제20항 중 어느 한 항에 있어서, 유입 및 유출을 수용하기 위한 뚜껑의 천공 위치는 카트리지를 통과하는 수성 매체가 입구로부터 출구로 물리적으로 내향 이동하도록 하는 카트리지.

청구항 22

제1항 내지 제21항 중 어느 한 항에 있어서, 수성 매체가 저장 챔버를 통상적으로 상향 관통하도록 형성된 카트리지.

청구항 23

제1항 내지 제22항 중 어느 한 항에 있어서, 각각의 카트리지에 포함된 둘 이상의 음료 성분(200)으로부터 생산된 음료의 간출률은 1.0 또는 그 미만 내에서 유지되는 특수계의 카트리지.

청구항 24

제1항 내지 제23항의 카트리지를 사용하기 위한 방법에서, 카트리지로의 입구 또는 카트리지로부터의 출구를 형성하기 위해, 카트리지가 둘 이상의 형적 천공 요소에 상대적으로 변위되는 카트리지 사용 방법.

청구항 25

둘 이상의 음료 성분(200)을 포함하고 사실상 공기 및 물이 침투할 수 없는 재료로 형성된 카트리지(1)이며, 상기 카트리지는 둘 이상의 음료 성분을 포함하는 챔버를 한정하고 뚜껑(5)을 더 포함하며, 사용시 수성 매체의 유입과 유출 모두를 수용하도록 카트리지가 수평 방향으로 인출 및 투입이 천공 가능하도록 카트리지가 형성되어서, 챔버 내의 둘 이상의 음료 성분과 수성 매체의 상호 작용으로부터 음료를 형성하는 카트리지.

청구항 26

제25항에 있어서, 수성 매체의 유입은 제1 챔버로 향하고 음료의 유출은 제2 챔버로부터 이루어지는 카트리지.

청구항 27

제26항에 있어서, 제1 챔버는 메니홀드 챔버인 카트리지.

청구항 28

제26항 또는 제27항에 있어서, 제2 챔버는 배출 챔버인 카트리지.

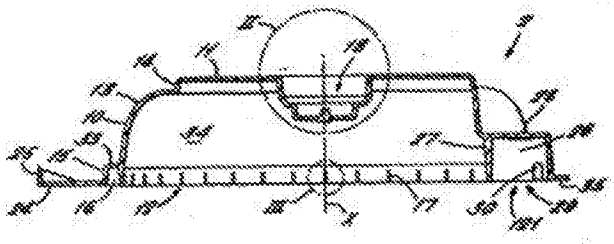
청구항 29

제28항에 있어서, 메니홀드 챔버 및 배출 챔버와 분리되어 있는, 둘 이상의 음료 성분을 포함하는 저장 챔버를 더 포함하는 카트리지.

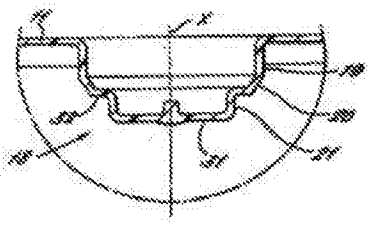
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도면

도면1



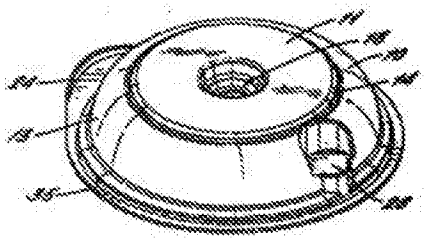
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도면3

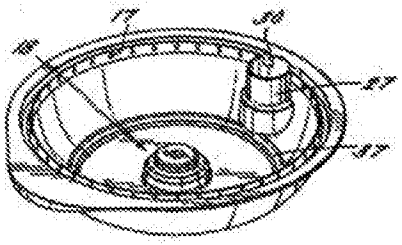


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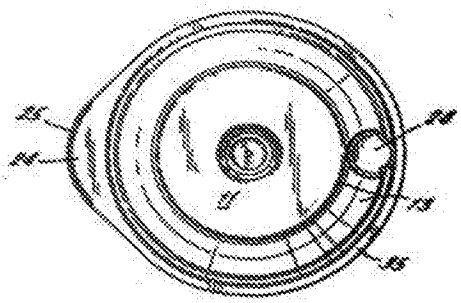


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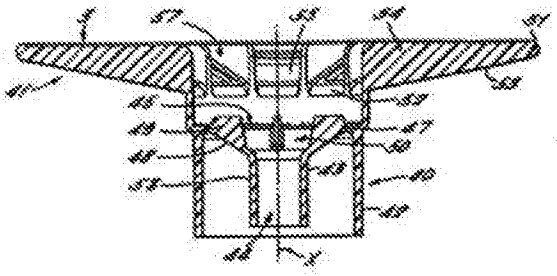
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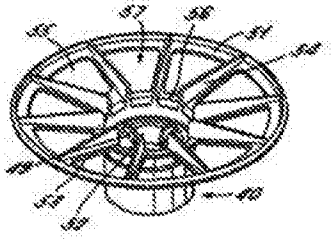
도 26



도 27

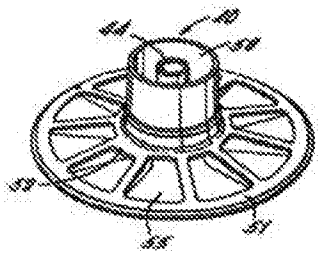


도 28

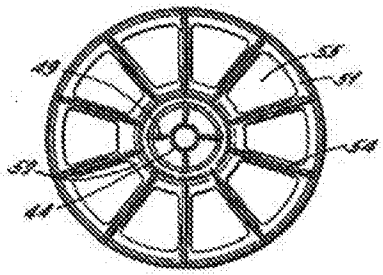


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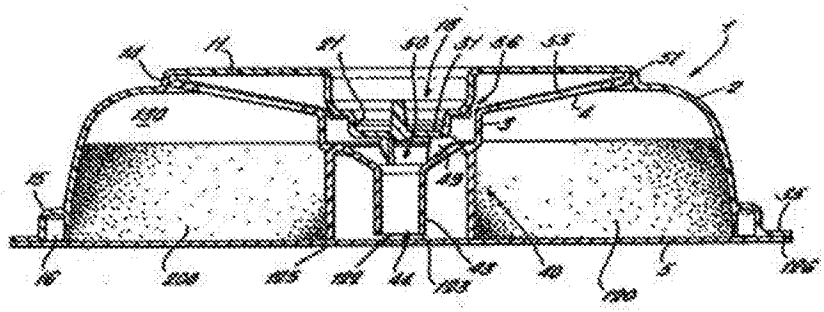
도면9



도면10

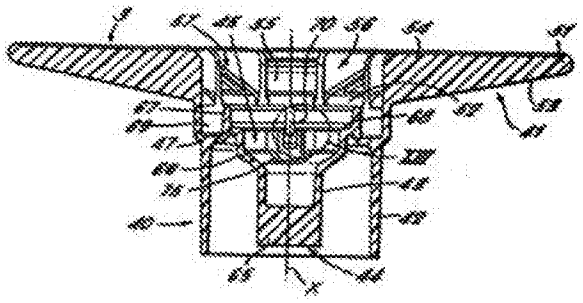


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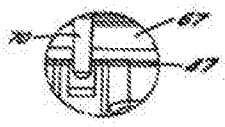


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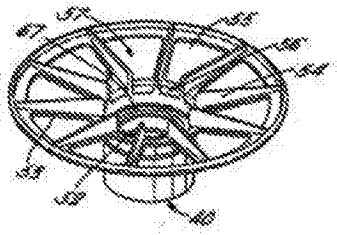
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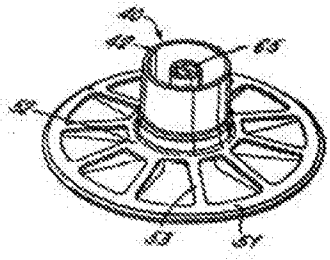
도면3



도면4

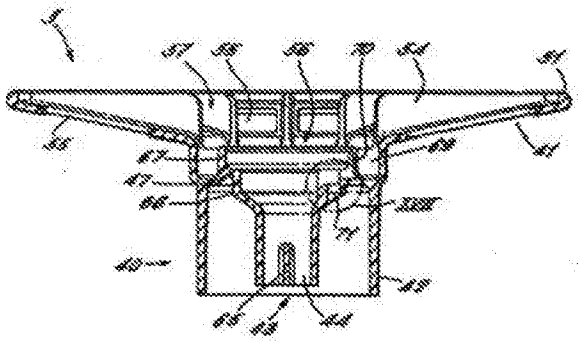


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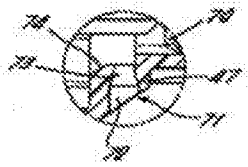


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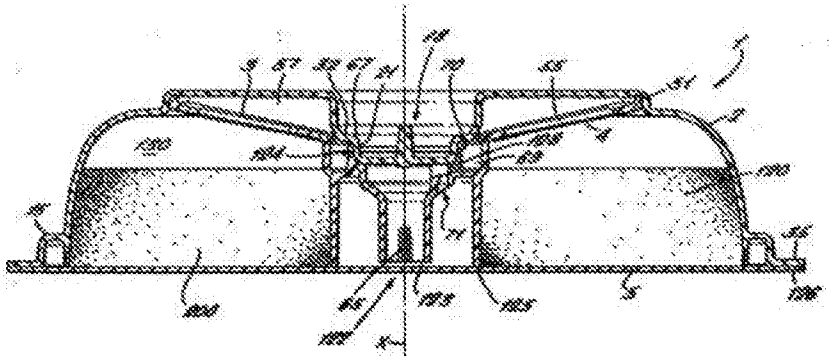
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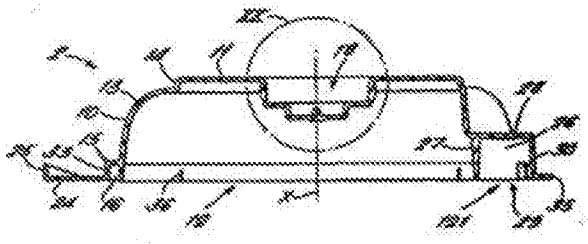
도면17



도면18

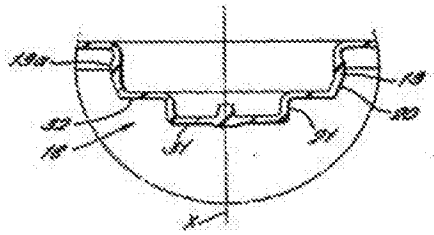


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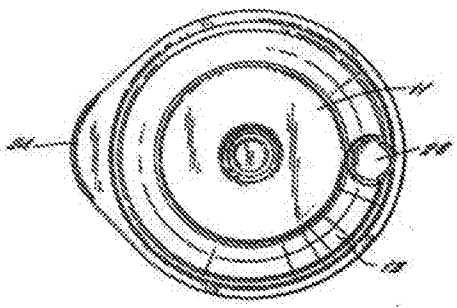


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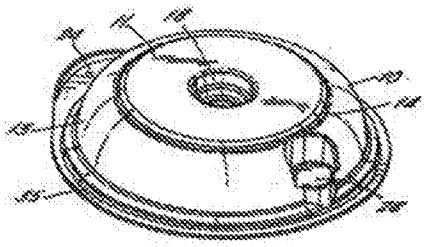
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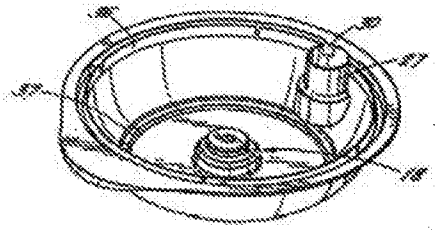
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도면22

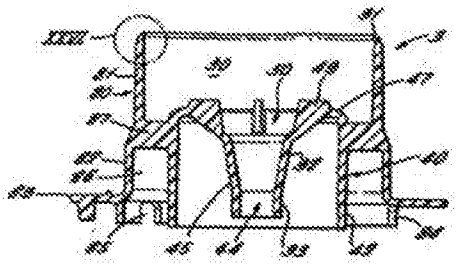


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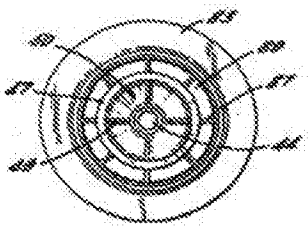


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도면4



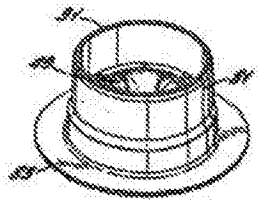
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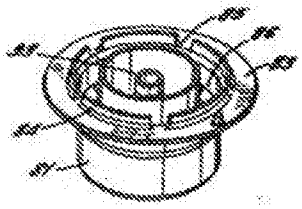
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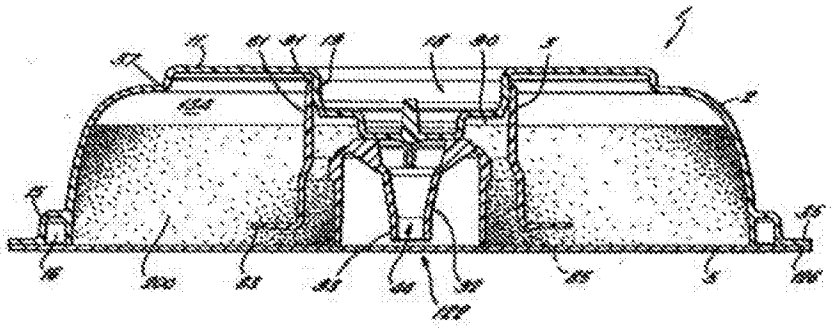


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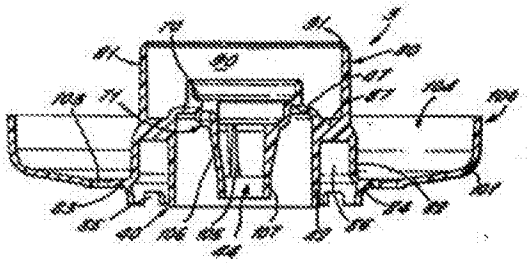


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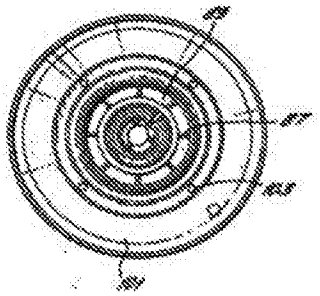
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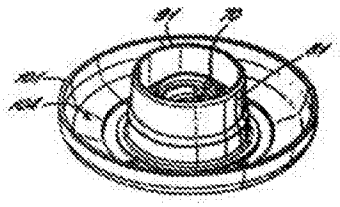
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도면5

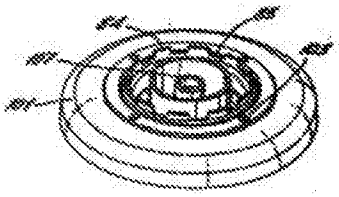


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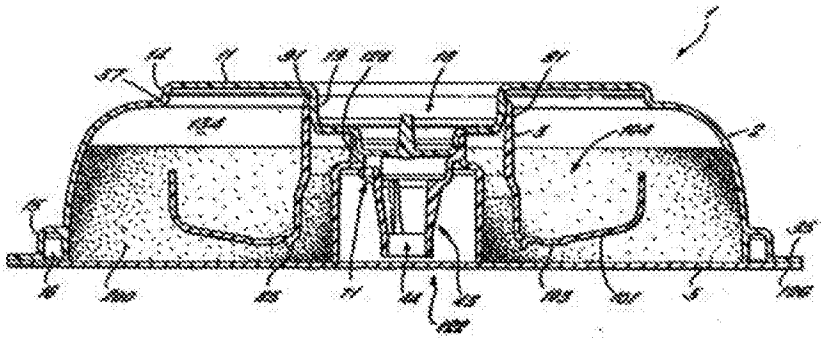


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도면3

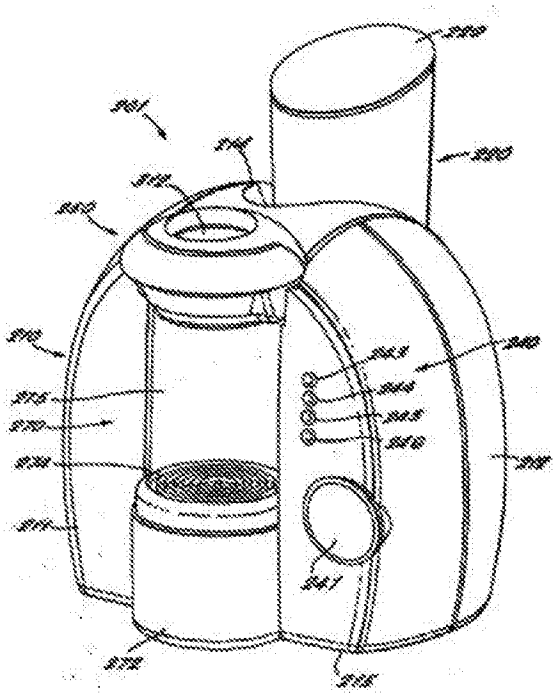


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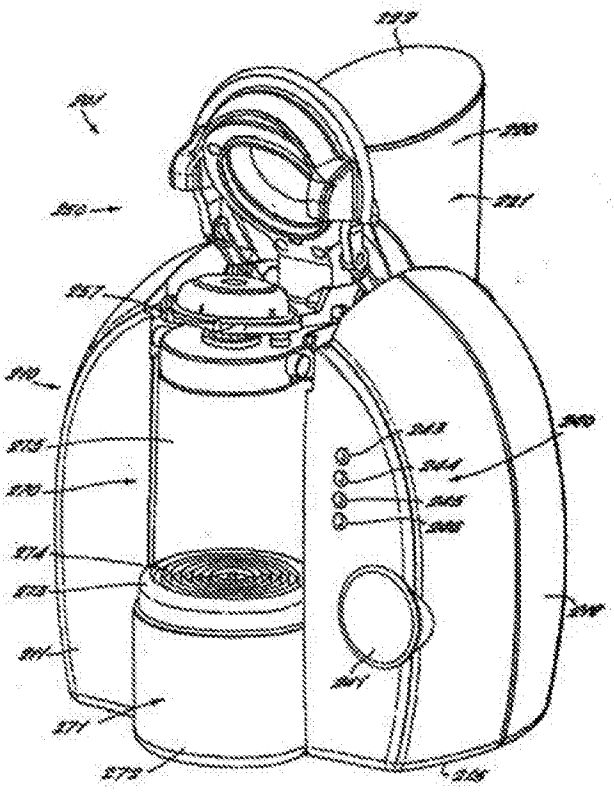
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도면35



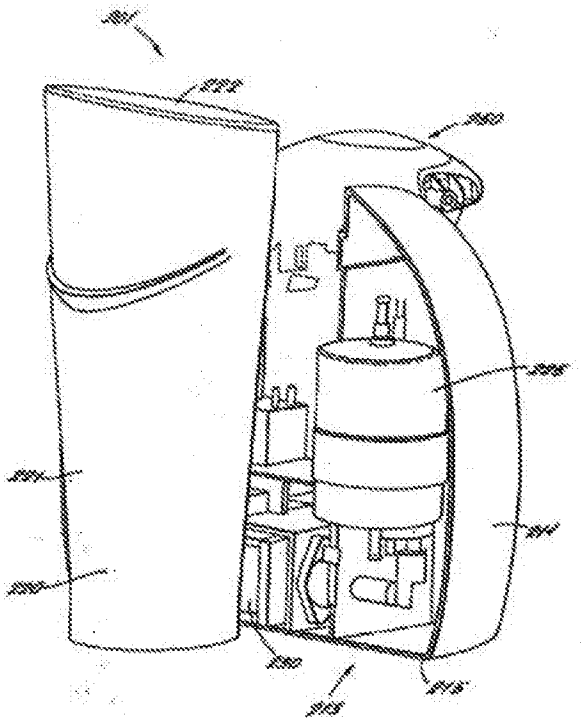
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도면3



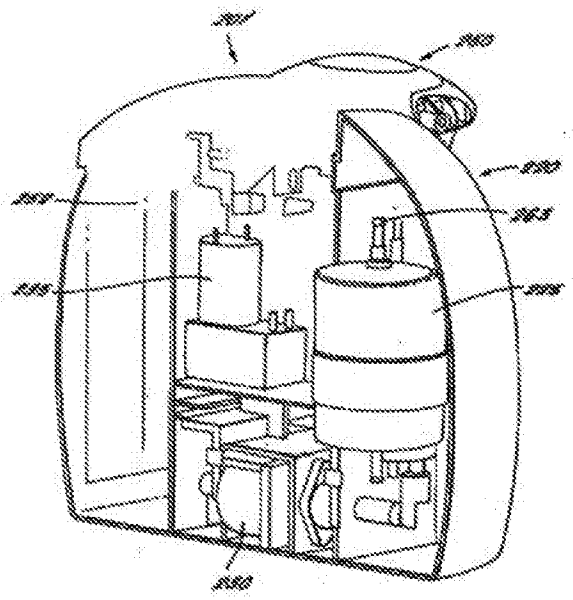
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도면3

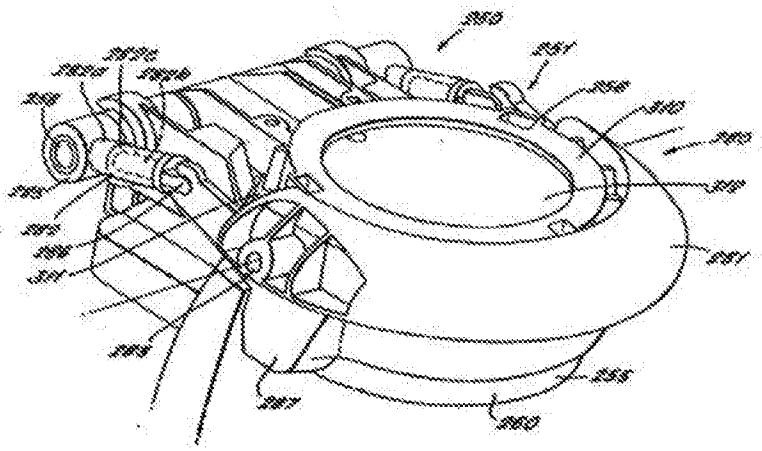


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도면3

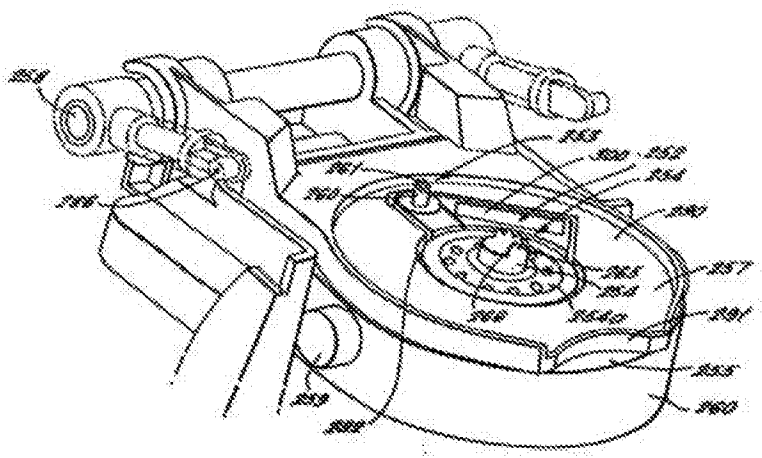


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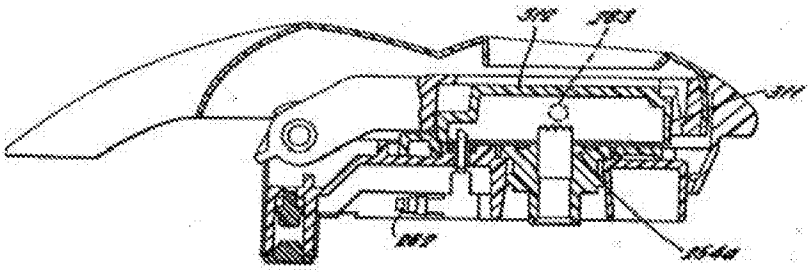


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도면3

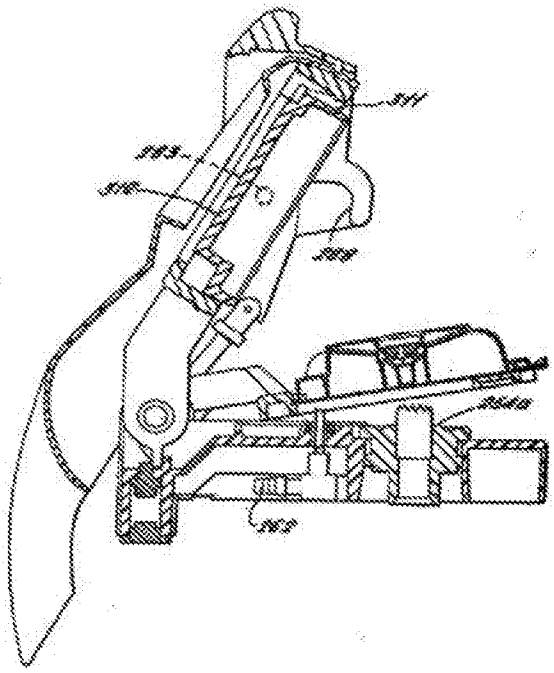


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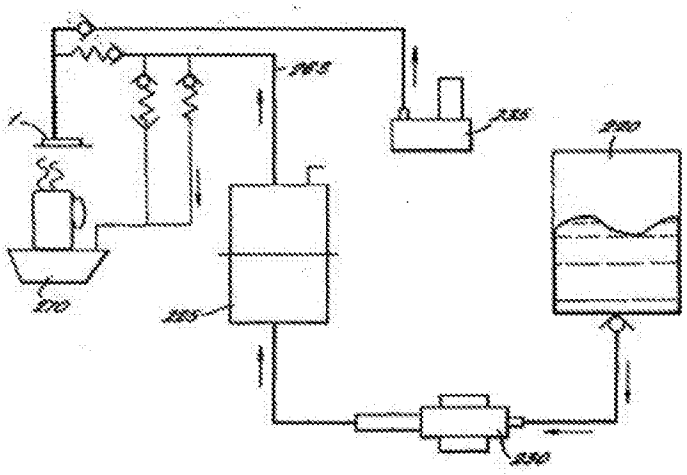


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도면2

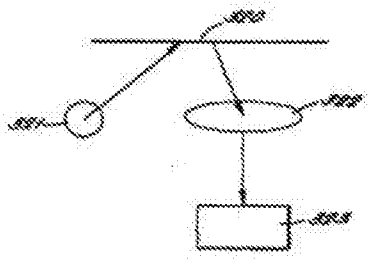


도면3

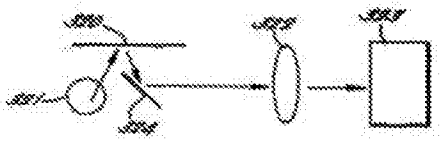


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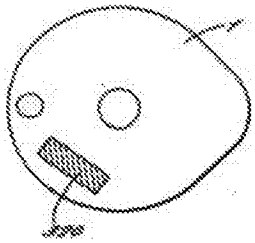
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CARTRIDGE FOR THE PREPARATION OF BEVERAGES

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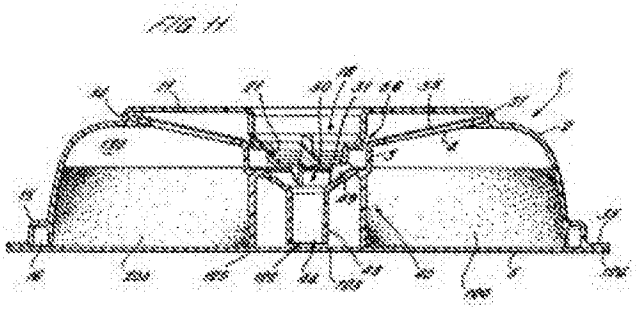
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- cooperative: **A47J31/0673; A47J31/3633; A47J31/3695; A47J31/407; A47J31/4407; A47J31/446; A47J31/4492; A47J31/56; B65D85/8043** more

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Abstract of KR20050107747 (A)



A cartridge (1) containing one or more beverage ingredients (200) and being formed from substantially air-and water-impermeable materials, the cartridge defining a storage chamber (130; 134) containing the one or more beverage ingredients and a manifold chamber (16), the cartridge comprising an opening (12) through which the one or more beverage ingredients can be filled into the storage chamber, the opening being closed by a lid (5) having a first portion overlying the manifold chamber and a second portion overlying the storage chamber, wherein the first portion of the lid is pierceable in use to accommodate an inflow of an aqueous medium into the manifold chamber and the lid is pierceable in use to accommodate an

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outflow of beverage formed from interaction of the aqueous medium and the one or more beverage ingredients in the storage chamber.

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DESCRIPTION KR20050107747

[0001] CARTRIDGE FOR THE PREPARATION OF BEVERAGES [0002]

The present invention relates to a cartridge for the preparation of beverages, in particular to a sealed cartridge formed from a material which is substantially impermeable to air and water and which contains one or more components for the preparation of a beverage.

It has heretofore been proposed to seal beverage ingredients in individual air impermeable packages. For example, cartridges or capsules containing compacted ground coffee for use in certain coffee preparation machines, commonly referred to as & quot; espresso & quot; machines, are known. In the production of coffee using such a dispensing machine, the coffee cartridges are placed in a brewing chamber, and hot water is passed through the cartridges at relatively high pressure to extract the coffee aroma components from the ground coffee to produce a coffee drink . Typically, such a machine operates at pressures in excess of 6 x 10 & lt; 5 & gt; Pa. The described types of dispensing machines are now relatively expensive machines, as parts of the machine, such as water pumps and seals, must be able to withstand high pressures.

International Patent Publication No. WO 01/58786 describes a cartridge for the preparation of beverages which operate at pressures in the range of approximately 0.7 to 2.0 x 105 Pa. However, cartridges are designed to be used in beverage dispensing machines for commercial or industrial markets and are relatively expensive. Thus, there remains a need for cartridges and beverage preparation machines for cartridges for the preparation of beverages that are particularly suitable for the home market in terms of cost, performance and reliability.

In a generally known beverage cartridge, the inlet and outlet of the beverage cartridge are formed on opposite sides of the cartridge. The beverage making machine used to dispense cartridges has the disadvantage of requiring a complicated mechanical device to move the inlet and outlet perforations from the opposite direction to engage the cartridge. In addition, the inlet and outlet perforations can prevent the beverage cartridge from accessing the beverage preparation machine for insertion and removal. WO 01/60220 discloses a beverage cartridge in which an inlet and an outlet are formed on the same side of the cartridge. However, such cartridges are susceptible to blocking the inlet piercing because the inlet perforations can directly contact the beverage ingredients.

Accordingly, the present invention provides a cartridge comprising one or more beverage ingredients and consisting essentially of a material that is impermeable to air and water, said cartridge forming a manifold chamber with a reservoir chamber comprising one or more beverage ingredients, An opening that can be closed by a lid having a first portion that covers the fold chamber and a second portion that covers the reservoir chamber, wherein one or more beverage ingredients can be filled into the reservoir chamber through the opening, 1 portion is pierceable in use to accommodate entry of the aqueous medium into the manifold chamber and the lid is pierceable in use to accommodate the outflow of beverage formed from the interaction of one or more beverage ingredients in the storage chamber with the aqueous medium.

The term & quot; cartridge & quot; as used herein refers to any package, container, sachet or receptacle containing one or more beverage ingredients in the manner described above.

The cartridge for use with the present invention may contain one or more beverage ingredients suitable for the preparation of beverage products. The beverage product can be, for example, one of coffee, tea, chocolate, or dairy based beverages including milk. The beverage ingredient may be in a powder form, a pulverized [illegible]

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ingredient may be insoluble or soluble. Examples include roast and ground coffee, leaf tea, powdered chocolate and soup, liquid milk based beverages and concentrated fruit juices.

The cartridges of the present invention are advantageous in that beverage inflow and outflow from the cartridge is made from the same side, i.e., the lid. This can be made simpler since the inflow and outflow perforations of the beverage preparation machine used with the cartridge are provided on a common plane. Further, the overall height of the beverage preparation machine can be reduced since it is not necessary to provide perforation means and associated flow pipes at the top or bottom of the cartridge. In addition, since a smaller number of parts can be placed on the cartridge, the approach for inserting and removing the cartridge with the beverage preparation machine is improved. The cartridge of the present invention also provides a manifold chamber in which an aqueous medium, such as water, is introduced. The manifold chamber is separated from the storage chamber containing beverage ingredients. The impairment of the inflow perforation of the beverage preparation machine is prevented because the inflow perforations do not directly contact the beverage ingredients. The manifold chamber also improves the water circulation in the cartridge and improves the balance of water flow into the storage chamber and water flow through the storage chamber. This improves the sustainability of discharge from the beverage cartridge.

Preferably, the cartridge further comprises a discharge chamber below a third portion of the lid which, in use, can be drilled to receive a beverage effluent formed from the interaction between the aqueous medium and one or more beverage ingredients in the storage chamber.

Preferably, the discharge chamber comprises an outlet.

Preferably, the manifold chamber and the reservoir chamber are divided by a compartment containing one or more openings. The opening is sized to prevent one or more beverage ingredients from entering the manifold chamber from the storage chamber. Since the beverage component can not pass through the opening, the manifold chamber is kept free of beverage ingredients.

Preferably, the manifold chamber at least partially surrounds the reservoir chamber. In one embodiment, the manifold chamber substantially completely encloses the reservoir chamber. Typically, the manifold chamber substantially surrounds the reservoir chamber and an opening is provided along virtually any interface between the manifold chamber and the reservoir chamber.

Preferably, the opening has a width of 0.25 to 0.35 mm and a length of 1.4 to 1.8 mm. Typically 20 to 40 openings are provided.

Preferably, the manifold chamber includes an inlet through which an aqueous medium is introduced, the inlet communicating with the remainder of the manifold chamber through one or more openings. Preferably, the inlet portion is circular.

Preferably, the storage chamber and the discharge chamber are divided by an inner member. The inner member includes one or more openings. In one embodiment, the inner member includes a filter that prevents one or more beverage ingredients from entering the discharge chamber from the storage chamber while receiving the passage of the beverage.

Preferably, the lid is associated with an outer member and an inner member. Typically, the lid engages the outer member around the periphery of the cartridge and engages the inner member near the center of the cartridge. The lid may be coupled to an exit funnel of the inner member.

Preferably, the outer member has a greater rigidity than the lid.

Preferably, the perforations in the lid for receiving the inflow and outflow are positioned such that the aqueous medium through the cartridge moves inwardly from the inlet to the outlet.

Also preferably, the cartridge is formed such that the aqueous medium is typically upwardly pierced through the reservoir chamber.

The present invention may also provide a plurality of cartridges as described above wherein the yield rate of the beverage produced from the one or more beverage ingredients contained in the cartridge is maintained within a 1.0 standard deviation.

The present invention also provides a method of using the cartridge as described above, wherein the cartridge is displaced relative to one or more static perforation elements to form an inlet to the cartridge or an outlet from the cartridge. This is advantageous in that a simplified perforation mechanism that does not require articulating or otherwise moving can be used. In addition, since the perforation element is stationary, a more precise alignment of the cartridge and perforation element is achieved, resulting in reduced frying of the aqueous medium, especially in the outflow, and improved performance.

The present invention also provides a cartridge comprising one or more beverage ingredients and consisting essentially of a material that is impermeable to air and water, said cartridge forming a chamber comprising one or more beverage ingredients and further comprising a lid, A cartridge is formed such that the lid is perforable when the cartridge is in a horizontal orientation to accommodate both the inflow and outflow of the aqueous medium to form a beverage from the interaction of one or more beverage ingredients in the chamber with the aqueous medium. Advantageously, the horizontal positioning of the cartridge

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